EXHIBIT 2

Wasatch Clean Air Coalition
Utah Chapter Sierra Club
Great Basin Foundation
Rocky Mountain Office of Environmental Defense
Land and Water Fund of the Rockies
Clean Air Task Force

April 14, 2003

Rick Sprott
Director
Utah Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84116

Re: Comments on Intermountain Power Service Corporation Notice of Intent for Intermountain Power Project (Dec. 2002)

Dear Mr. Sprott:

The Wasatch Clean Air Coalition, Utah Chapter of the Sierra Club, Great Basin Foundation, Rocky Mountain Office of Environmental Defense, Land and Water Fund of the Rockies, and Clean Air Task Force, respectfully submit the following comments regarding the December 2002 Notice of Intent (NOI) for the Intermountain Power Project (IPP). We believe it would be contrary to law for Utah to determine that the application materials are complete or to provide public notice of the state's intent to approve the proposed construction of this facility without first addressing the serious deficiencies examined in detail below. We greatly appreciate your consideration of our views.

FEDERAL AND STATE CLEAN AIR LAWS REQUIRE THE APPLICANT TO CONSIDER AVAILABLE CLEAN COAL TECHNOLOGY METHODS TO LOWER AIRBORNE CONTAMINANTS FROM IPP.

Integrated Gasification Coal Combustion (IGCC) and Circulating Fluidized Bed (CFB) are available, demonstrated cleaner coal combustion technologies with significant emission reduction benefits as compared to conventional PC boilers. But the permit application does not evaluate clean coal technology. Because IPP did not fully consider IGCC or CFB in its BACT analysis, Utah must direct the applicant to thoroughly evaluate these advanced combustion options as part of the BACT analysis. Indeed, the

state has a duty as part of the core of the BACT determination process to provide a reasoned justification for rejecting an available control technology.

Utah and Federal Law Require a Thorough Evaluation of IGCC and CFB Clean Coal Technologies as Part of the BACT Analysis.

Section 165(a)(4) of the Clean Air Act (CAA) provides that "no major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless…the facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility."[1] The requirement for conducting a BACT analysis is codified at 40 CFR § 51.166(j), in regulations setting forth the requirements for state-administered PSD programs. Utah law, in turn, requires that an approval order may be issued only if "[t]he degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology. . ."[2]

BACT is then defined under Utah law as follows:

> [A]n emission limitation and/or other controls to include design, equipment, work practice, operation standard or combination thereof, based on the maximum degree of reduction of each pollutant subject to regulation under the Clean Air Act and/or Utah Air Conservation Act emitted from or which results from any emitting installation, which the Air Quality Board, on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable for such installation through the application of production processes and available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant.[3]

The wording of the definition of BACT found within Utah's regulations is similar to the federal definition at 40 CFR § 51.166(b)(12). Indeed, Utah's definition of BACT must be consistent with the SIP requirements under federal regulations, which provide that "[a]ll State plans shall use the following definitions for the purposes of this section. Deviations from the following wording will be approved only if the State specifically demonstrates that the submitted definition is more stringent, or at least as stringent, in all respects" as the federal definitions.[4] Thus, the BACT requirement must be implemented and construed under Utah law at least as strictly as EPA and the federal courts have construed it.

EPA and federal courts have consistently interpreted the BACT provisions found in the CAA and the agency's regulations as embodying certain core criteria that require the

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[1] 42 U.S.C. §7475(a)(4).
[2] UT Air Quality Rules 307-401-6(1) (hereinafter "UT AQR").
[3] UT AQR 307-101-2.
[4] 40 CFR §51.166(b).

permit applicant either to implement the most effective available means for minimizing air pollution or justify its selection of less effective means on grounds consistent with the purposes of the Act. In *Citizens for Clean Air v. EPA*,[5] the Ninth Circuit held that "initially the burden rests with the PSD applicant to identify the best available control." As stated in long-standing EPA guidance, "[r]egardless of the specific methodology used for determining BACT, be it 'top-down,' 'bottom-up,' or otherwise, the same core criteria apply to any BACT analysis: the applicant must consider all available alternatives, and [either select the most stringent of them or] demonstrate why the most stringent should not be adopted."[6] Accordingly, the PSD permit applicant not only must identify all available technologies, including the most stringent, but it must also provide adequate justification for dismissing any available technologies.

Consistent with these core criteria, the EPA's New Source Review (NSR) Workshop Manual establishes that, as the first step in the "top-down" BACT analysis, the applicant *must* consider all "available" control options:

> The first step in a "top-down" analysis is to identify, for the emissions unit in question (the term "emissions unit" should be read to mean emissions unit, process or activity), all "available" control options. Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. Air pollution control technologies and techniques include the application of production process or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the affected pollutant. This includes technologies employed outside of the United States. As discussed later, in some circumstances inherently lower-polluting processes are appropriate for consideration as available control alternatives.[7]

"The term 'available' is used…to refer to whether the technology 'can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term.'"[8] In keeping with the stringent nature of the BACT requirement, EPA has repeatedly emphasized that "available"

> is used in the broadest sense under the first step and refers to control options with a "practical *potential* for application to the

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[5] 959 F.2d 839, 845 (9th Cir. 1992)

[6] Memorandum from John Calcagni, Director of EPA Air Quality Management Division, to EPA Regional Air Directors (June 13, 1989), at 4 (emphasis added).

[7] NSR Manual, at p. B.5 (emphasis added).

[8] In re: Maui Electric Company, PSD Appeal No. 98-2 (EAB September 10, 1998), at 29-30 (quoting NSR Manual at B.17).

> emissions unit" under evaluation. . . . The goal of this step is to develop a comprehensive list of control options.[9]

EPA adjudicatory decisions also examine the core requirements for the BACT determination process. "Under the top-down methodology, applicants must apply the best available control technology unless they can demonstrate that the technology is technically or economically infeasible. The top-down approach places the burden of proof on the *applicant* to justify why the proposed source is unable to apply the best technology available."[10]

Whatever analytical process is utilized for determining BACT, these core criteria – the requirement to consider all available technologies, including the most stringent, and to provide adequate justification in the administrative record for dismissing any of the technologies based on relevant statutory factors – must be satisfied.

Thus, to conduct a BACT analysis consistent with the requirements of state and federal law, IPP must thoroughly evaluate all available control measures. Advanced coal combustion technologies -- including IGCC and CFB -- are commercially available today and would significantly reduce the volume of pollutants created by proposed new generating units, as discussed in detail below. Utah and federal law therefore require that these technologies be thoroughly evaluated as part of the BACT analysis.

Contrary to law, IPP does not consider these available methods, systems, and techniques in its BACT analysis but instead focuses exclusively on add-on pollution control technologies for pulverized coal units. The definitions of BACT under Utah and federal law, and the core requirements of the BACT analysis under federal case law, EPA adjudicatory decisions, and the New Source Review Manual, demonstrate that available techniques such as IGCC and CFB must be identified and evaluated as control options in the first step of the BACT analysis. These are minimum core requirements of a state-administered PSD program.

Recent State Actions Requiring Consideration of Clean Coal Technology Establish Irrefutable Precedence for the Consideration of IGCC and CFB.

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[9] In re: Knauf Fiber Glass, PSD Appeal Nos. 98-3 – 98-20 (EAB February 4, 1999), at 12-13 (quoting NSR Manual at B.5) (emphasis added by EAB); see also In re: Steel Dynamics, Inc., PSD Appeal Nos. 99-4 and 99-5 (EAB June 22, 2000), at 29 n.24 (citing Knauf with approval); NSR Manual at B.10 ("The objective in step 1 is to identify all control options with potential application to the source and pollutant under evaluation."); id. at B.6 (emphasizing that a proper Step 1 list is "comprehensive").

[10] In re: Spokane Regional Waste-to-Energy Applicant, PSD Appeal No. 88-12 (EPA June 9, 1989), at 9) (internal quotation marks omitted) (emphasis in original); see also In re: Inter-Power of New York, Inc. PSD Appeal Nos. 92-8 and 92-9 (EAB March 16, 1994) ("Under the 'top-down' approach, permit applicants must apply the most stringent control alternative, unless the applicant can demonstrate that the alternative is not technically or economically achievable."); In the Matter of Pennsauken County, New Jersey Resource Recovery Facility, PSD Appeal No. 88-8 (EAB November 10, 1988) ("Thus, the 'top-down' approach shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available.")

Reflecting the viability of IGCC and CFB, the State of New Mexico issued a letter on December 23, 2002 requiring the permit applicant for a new coal-fired power plant to conduct a site-specific analysis of IGCC and CFB as part of the BACT analysis for the proposed facility: "The Department requires a site-specific analysis of IGCC and CFB in order to make a determination regarding BACT for the proposed facility." The New Mexico determination goes on to provide: "The analysis must include a discussion of the technical feasibility and availability of IGCC and CFB for the proposed site in McKinley County, including a discussion of existing IGCC and CFB systems."[11]

In March 2003, the State of Illinois likewise required the applicant for a proposed coal-fired electric generation facility to conduct a robust analysis of IGCC as a core element of its BACT analysis:

> Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a 'production process' that can be used to produce electricity from coal. In this regard, the Illinois EPA has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.
>
> Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant.[12]

In an ensuing letter, the State of Illinois then formally informed EPA that Illinois has "concluded that it is appropriate for applicants for [proposed coal-fired power plants] to consider IGCC as part of their BACT demonstrations."[13]

Similarly, the Georgia Department of Natural Resources, in a March 2002 letter regarding the permit application of Longleaf Energy Station, also relied, in part, on the failure of the permit applicant to consider clean coal combustion technology in finding

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11 Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Corporation (Dec. 23, 2002). ATTACHMENT A.

12 Letter from Illinois Division of Air Pollution Control to Jim Schneider, Indeck-Elwood, LLC (March 8, 2003). ATTACHMENT B.

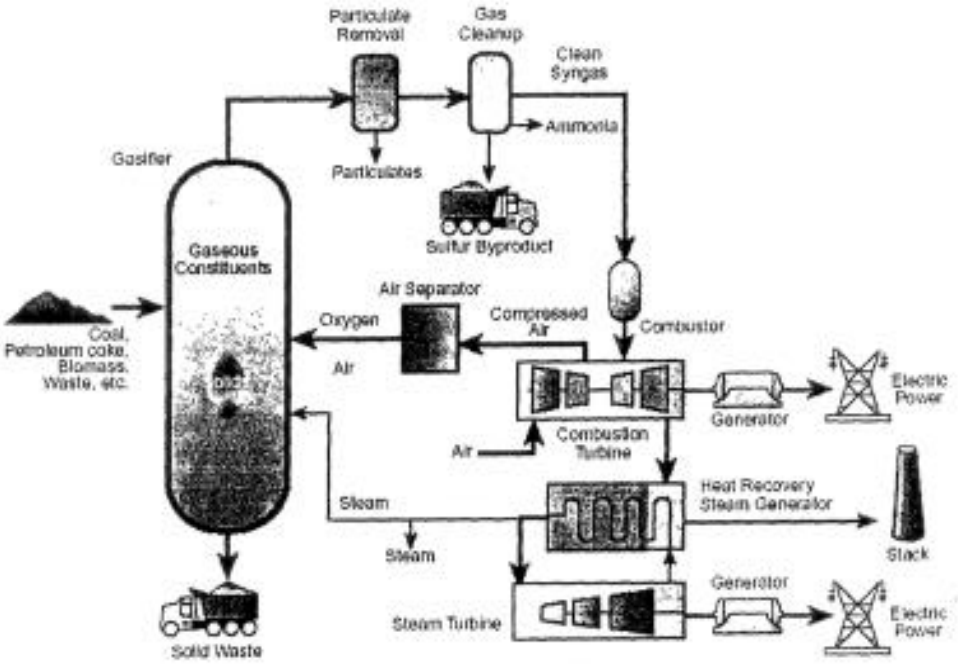
13 Letter from Illinois EPA Director to EPA Regional Administrator, Region V (March 19, 2003). ATTACHMENT B.

the application deficient. In making its determination of deficiency, Georgia stated that the applicant did not "discuss any other methods from generating electricity from the combustion of coal, such as pressurized fluidized bed combustion or integrated gasification combined cycle."[14] Georgia further stated that the applicant "should discuss these technologies and explain why you elected to propose a pulverized coal-fired steam electric power plant instead."[15]

IGCC Must be Considered in the BACT Analysis.

IGCC is an available method, system and technique for curbing air pollutants from IPP consistent with Utah's definition of BACT.[16]

Electricity generation from coal using IGCC technology is a commercially available and proven process. IGCC units generate electricity by integrating a coal gasifier with combined cycle (combustion turbine and steam turbine) electricity generation equipment (see figure below).



[14] Letter from James A. Capp, Manager, Stationary Source Permitting Program, Georgia DNR, to D. Blake Wheatley, Assistant Vice President, Longleaf Energy Associates, LLC (March 6, 2002). ATTACHMENT C.
[15] Id.
[16] UT AQR 307-101-2.

Two full scale commercial IGCC electric generating units are in operation in the United States: Tampa Electric Company's 262 MW unit at the Polk plant in Florida and Cinergy's 192 MW unit at the Wabash River plant in Indiana, which both rely on coal as a fuel source.[17] IGCC units can be constructed with multiple gasifiers to achieve unit availability at levels comparable to those of conventional baseload facilities. For instance, the Eastman Chemical plant in Kingsport, Tennessee has utilized a dual-gasifier design to produce chemicals from syngas and has experienced 98 percent availability since 1986.[18] ChevronTexaco claims that its new Standard Project Initiative Reference IGCC Plant achieves greater than 90% availability by using multiple gas trains.[19]

Worldwide there are 131 gasification projects in operation with a combined capacity equivalent to 23,750 MW of IGCC units.[20] An additional 31 projects are planned that would increase this capacity by more than 50 percent.[21] Although not all of these projects produce electricity from coal, they demonstrate widespread commercial application of gasification technology for fuel processing, one of two key components of an IGCC plant. The second component is a combined cycle electricity generating system, which is now commonplace for new natural gas fired power plants.

IGCC units are available from major well-known vendors. Coal gasification equipment is available from ChevronTexaco, Shell, and Global Energy, while major turbine manufacturers, including GE and Siemens-Westinghouse, provide combined cycle generators designed to run on the synthesis gas produced by coal gasifiers. Engineers from Texaco, Jacobs Engineering, and GE have teamed up to offer a standardized IGCC design.[22] James Childress, the Executive Director of the Gasification Technology Council, provided testimony to the U.S. Senate Environment and Public Works Committee stating, "[g]asification is a widely used commercially proven technology."[23] At the same hearing, Edward Lowe, Gas Turbine-Combined Cycle Product Line Manager for General Electric Power Systems, stated that, "IGCC is inherently less polluting and more efficient than any other coal power generation technology."[24] Likewise, the National Coal Council, in a May 2001 report, confirms that IGCC is "viable,

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[17] Resource Systems Group, Inc., EPIndex. See www.epindex.com

[18] Smith, R.G., "Eastman Chemical Plant Kingsport Plant Chemicals from Coal Operations,1983-2000," 2000 Gasification Technologies Conference.

[19] O'Keefe, L. and Sturm, K., "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," presentation to the 2002 Gasification Technologies Conference, October 2002

[20] Simbeck, Dale, SFA Pacific Inc. Gasification Technology Update, presented to the European Gasification Conference, April 8-10, 2002. The total capacity is based on output of synthesis gas. Many of these projects produce chemicals in addition to or instead of electricity.

[21] Id.

[22] O'Keefe, Luke, et al. A Single IGCC Design for Variable CO_2 Capture.

[23] Childress, James M. Statement Submitted for the Record, Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.

[24] Lowe, Edward. *Outlook on Integrated Gasification Combined Cycle (IGCC) Technology*. Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.

commercially available technology."[25] ChevronTexaco, in an October 2002 presentation, states that, "IGCC is a current viable choice for clean coal capacity."[26] And the Center for Energy and Economic Development (CEED) states that, "IGCC technology is available for deployment today."[27]

IGCC's Environmental Performance is Superior to other Technologies for Generating Electricity from Coal.

The coal gasification fuel-processing step in IGCC power plants results in superior environmental performance. Gasifying coal at high pressure prior to combustion facilitates removal of pollutants that would otherwise be released into the air. According to James Childress, "...criteria pollutant emissions for a coal-based IGCC plant are well below those of even the most modern pulverized coal plants with post combustion cleanup."[28]

Criteria pollutants for a coal-based IGCC are below those of even the most modern pulverized coal plants with additional controls. NOx emissions are approximately half those of modern pulverized coal plants without any post-combustion controls. Sulfur is also removed from the syngas in pre-combustion cleanup so that emissions are less than half of state-of-the-art conventional coal plants. Particulate emissions are also reduced by 99.9 percent using IGCC technology relative to conventional coal technologies.

IGCC also has several other environmental advantages beyond its reductions in criteria pollutants. Mercury and CO_2 removal is easier and less expensive at IGCC units than at other coal-fired plants. Because an IGCC plant is typically 10 to 15 percent more efficient in terms of heat rate than a conventional sub-critical pulverized coal plant, carbon dioxide (CO2) emissions -- the primary greenhouse gas responsible for anthropogenic contributions to global warming -- are also reduced by that same amount. In addition, the concentrated CO2 in the pre-combustion gas stream can be captured and sequestered at a fraction of the cost of post-combustion carbon capture and sequestration at a conventional coal plant. The reduced CO_2 emissions rate has important environmental benefits in addressing the urgent problem of global climate change and also reduces increased costs due to future climate change regulations.

Furthermore, mercury removal rates of up to 90 percent can also be achieved using currently available control technologies with IGCC. DOE states that "an IGCC power plant has the potential of achieving very high mercury removal performance with established technology" and mercury removal in an IGCC power plant can be expected to

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[25] National Coal Council, Increasing Electricity Availability from Coal-Fired Power Plants in the Near Term, p. 20 (May 2001).
[26] "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," Luke O'Keefe and Karl Sturm (ChevronTexaco), October 28, 2002, p. 8. ATTACHMENT D.
[27] See www.ceednet.org/fueling/investing.asp
[28] Childress, James M. Statement Submitted for the Record, Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.

be very high in removal effectiveness, low in cost, and reliable in design."[29] DOE indicates that when comparing IGCC to PC boilers, "the cost of removal of mercury by a carbon bed in an IGCC plant is lower than in a pulverized coal (PC) plant."[30] In a direct comparison of costs, mercury removal in an IGCC facility is estimated to be $3,412 per pound whereas in a PC system (90% removal in a 975MW plant) the costs are estimated to be $37,800 per pound.[31]

Also, the vitrified solid waste created by IGCC has a number of marketable uses, thereby potentially reducing some of the solid waste disposal issues associated with coal combustion using conventional technologies.

The Wabash River facility's SO2 emissions are consistently below 0.10 lb/mmBtu and are reaching as low as 0.03 lb/mmBtu.[32] In addition, on March 26, 2002, the Ohio EPA issued a final permit for the Lima Energy project, a 580 MW IGCC facility consisting of two 290 MW combined cycle turbines. In June 2001, Kentucky issued a permit for Kentucky Pioneer. The Lima and Kentucky facilities are permitted to accept coal, and Lima can accept petroleum coke and refuse-derived fuel. Furthermore, in June 2002, Wisconsin Electric Power Company applied to the Wisconsin Department of Natural Resources for air permits for two supercritical pulverized coal units and one IGCC unit at the Elm Road site in Oak Creek, Wisconsin. The IGCC unit will be 615 MW.[33] Table 1 below summarizes the relevant emissions.

	Emission Rates (lb/mmBtu)			
Pollutant	IPP	Kentucky Pioneer (1)	Lima (1)	Elm Road (2)
S02	0.10	.032	.021	0.03
NOx	0.07	.074	.097	0.07
PM	0.015	.011	.01	0.011

(1) Permit limits written in terms of maximum lb/hr. The lb/mmBtu rate estimated from maximum heat input to the plant.
(2) Elm Road is not a permit level, but the level proposed by the company to state regulators.

As the current permitting actions for the Kentucky Pioneer, Lima Energy and Elm Road facilities demonstrate, IGCC is a cleaner technology.[34]

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[29] "The Cost of Mercury Removal in an IGCC Plant," US DOE, NETL, September 2002 at 1-2.
[30] "The Cost of Mercury Removal in an IGCC Plant," US DOE, NETL, September 2002 at 1-2.
[31] Id.
[32] See www.lanl.gov/projects.cctc/factsheets/wabsh/wabashrdemo.html
[33] Both the Lima Energy and Elm Road projects were designed to utilize either Ohio coals (Lima) or eastern bituminous coals (Elm Road). Coal gasification, however, is a flexible technology that can be designed for western coals.
[34] See also "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," Luke O'Keefe and Karl Sturm (ChevronTexaco), October 28, 2002, p. 30-42. ATTACHMENT D.

Utah Chapter Sierra Club
Wasatch Clean Air Coalition
Grand Canyon Trust
Rocky Mountain Office of Environmental Defense
Western Resource Advocates
Clean Air Task Force

May 20, 2004

By e-mail (milkar@utah.gov), Fax (801) 536-4099, and Federal Express
Milka M. Radulovic, Engineer
Utah Department of Environmental Quality
Richard W. Sprott
Director, Utah Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84116

Re: Comments on Intent to Approve PSD Major Modification to Add New Unit 3 at Intermountain Power Generating Station, DAQE-IN0327010-04

Dear Ms. Radulovic and Mr. Sprott:

The Utah Chapter of the Sierra Club, Wasatch Clean Air Coalition, Rocky Mountain Office of Environmental Defense, Western Resource Advocates, Grand Canyon Trust, and Clean Air Task Force, respectfully provide the following comments on Utah Division of Air Quality's ("UDAQ") draft Intent to Approve ("ITA" or "draft permit") PSD Major Modification to Add New Unit 3 at Intermountain Power Generating Station, DAQE-IN0327010-04. On April 14, 2003, we submitted extensive comments on Intermountain Power Service Corporation's (IPSC) December 2002 prevention of significant deterioration (PSD) permit application. For the most part, none of the comments we raised were adequately addressed by UDAQ in the ITA for proposed Unit 3 at the Intermountain Power Plant (IPP). A copy of that letter and attachments is attached and incorporated herein by reference to this letter. We have also identified other issues with the ITA that need to be addressed to comply with state and federal law. In summary, we believe it would be contrary to law and harmful to Utah's air quality for the UDAQ to approve the proposed construction of this facility without first addressing the serious deficiencies examined in detail below. We greatly appreciate your consideration of our views and UDAQ's efforts to make documents regarding this action easily available to interested parties. We would greatly appreciate being promptly notified of any subsequent action on this ITA, including issuance of any final Approval Order.

IPSC FAILED TO SUBMIT A COMPLETE PERMIT APPLICATION AND THUS CONSIDERATION OF THE PERMIT APPLICATION IS PREMATURE

IPSC failed to submit a complete permit application. Instead, IPSC submitted an "incomplete" application for public comment that it proposes to "fix" later. See 6/12/03 email from Sprott to LeBaron (attached). IPP's permitting strategy is illegal because it denies the public of a full opportunity to comment on all aspects of the permit application before a final permit is issued.

Further, the administrative record indicates that UDAQ is unable to assess important aspects of the permitting requirements because a boiler design has not been selected. More specifically, IPP admits that "the LOI content in the fly ash anticipated from Unit 3 cannot be predicted until a final boiler design is selected." See, 7/28/03 letter from IPA to UDAQ, p. 10. No permit should be issued until this can be quantified with certainty.

Moreover, IPSC has failed to identify, with any specificity, the coal type or coal quality to be burned at Unit 3. In fact, IPP's description of coal type and coal quality is conflicting and vague and thus it would be arbitrary and capricious for UDAQ to approve a final permit until this important aspect of the permit is specified. For example, for some emissions, like mercury, IPSC proposes to look at the range of coals that IPP Unit 3 will be designed to burn over the life of the plant (i.e., bituminous and subbituminous). See, 7/28/03 letter from IPA to UDAQ, p. 3 & 4. The range of mercury content of the coal (.02 ppm by weight to .15 ppm) provided by IPP is too broad and vague to be relied upon. Moreover, in the Technical Memorandum, it states that IPSC will only burn western bituminous coals. See, 9/8/03 Technical memorandum from CH2M Hill to UDAQ, p. 1. This is inconsistent with other statements in the administrative record. No final permit should be issued until IPP provides specific information on coal type and coal quality.

Finally, the draft permit is fatally flawed because it fails to contain specific coal quality requirements or a coal blending requirement to ensure all emission limits will be met. An earlier draft of the permit contained a percentage blending limit but was wrongfully eliminated from the permit at the urging of IPSC. See, March 1, 2004 draft permit from Radulovic, p. 156, condition 7.A. (attached) and 3/8/04 email from Sands to Radulovic (attached). It appears that IPSC is thwarting any attempt to identify with certainty the type and quality of the coal to be burned at Unit 3. It is essential that the final permit contain an enforceable coal quality/blending requirement to ensure that short term emission limits are met as well as other permit conditions. See, 2/5/03 email from Orth to Prey (attached) and 7/8/03 memo from Radulovic to Sands (attached).

IGCC MUST BE ADEQUATELY CONSIDERED AND IPSC'S IGCC BACT ANALYSIS IS FLAWED

FEDERAL AND STATE CLEAN AIR LAWS REQUIRE IPSC TO CONSIDER THE APPLICATION OF PRODUCTION PROCESSES AND AVAILABLE METHODS, SYSTEMS AND TECHNIQUES TO LOWER AIRBORNE CONTAMINANTS.

Integrated Gasification Combined Cycle (IGCC) is an available, demonstrated clean coal combustion technology with significant emission reduction benefits. There are numerous benefits to IGCC, including fewer emissions of criteria and hazardous air pollutants, the opportunity for capturing greenhouse gases, such as CO_2, that cause global warming, and a general increase in efficiency over other coal burning technologies. Because IPP's evaluation of IGCC is so flawed, UDAQ must deny the proposed permit. A properly conducted top-down BACT analysis, as follows in these comments, shows IGCC is BACT at the IPP site

Utah and Federal Law Require a Thorough Evaluation of IGCC Cleaner Coal Combustion Technology as Part of the BACT Analysis.

Section 165(a)(4) of the Clean Air Act (CAA) provides that "no major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless…the facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility."[1] The requirement for conducting a BACT analysis is codified at 40 CFR § 51.166(j), in regulations setting forth the requirements for state-administered PSD programs. Utah law, in turn, requires that an approval order may be issued only if "[t]he degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology. . ."[2]

BACT is then defined under Utah law as follows:

> [A]n emission limitation and/or other controls to include design, equipment, work practice, operation standard or combination thereof, based on the maximum degree of reduction of each pollutant subject to regulation under the Clean Air Act and/or Utah Air Conservation Act emitted from or which results from any emitting installation, which the Air Quality Board, on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable for such installation through the application of production processes and available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant.[3]

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[1] 42 U.S.C. §7475(a)(4).
[2] UT Air Quality Rules 307-401-6(1) (hereinafter "UT AQR").
[3] UT AQR 307-101-2.

The wording of the definition of BACT found within Utah's regulations is similar to the federal definition at 40 CFR § 51.166(b)(12). Indeed, Utah's definition of BACT must be consistent with the SIP requirements under federal regulations, which provide that "[a]ll State plans shall use the following definitions for the purposes of this section. Deviations from the following wording will be approved only if the State specifically demonstrates that the submitted definition is more stringent, or at least as stringent, in all respects" as the federal definitions.[4] Thus, the BACT requirement must be implemented and construed under Utah law at least as strictly as EPA and the federal courts have construed it.

This definition includes coal gasification. The legislative history of the amendment adding the term "innovative fuel combustion techniques" to the Clean Air Act's definition of "BACT" is clear. Coal gasification must be considered. The relevant passage of the debate is excerpted below:

> Mr. HUDDLESTON. Mr. President, the proposed provisions for application of best available control technology to all new major emission sources, although having the admirable intent of achieving consistently clean air through the required use of best controls, if not properly interpreted may deter the use of some of the most effective pollution controls. The definition in the committee bill of best available control technology indicates a consideration for various control strategies by including the phrase "through application of production processes and available methods systems, and techniques, including fuel cleaning or treatment." And I believe it is likely that the concept of BACT is intended to include such technologies as low Btu gasification and fluidized bed combustion. But, this intention is not explicitly spelled out, and I am concerned that without clarification, the possibility of misinterpretation would remain. It is the purpose of this amendment to leave no doubt that in determining best available control technology, all actions taken by the fuel user are to be taken into account--be they the purchasing or production of fuels which may have been cleaned or up-graded through chemical treatment, gasification, or liquefaction; use of combustion systems such as fluidized bed combustion which specifically reduce emissions and/or the post-combustion treatment of emissions with cleanup equipment like stack scrubbers. The purpose, as I say, is just to be more explicit, to make sure there is no chance of misinterpretation. Mr. President, I believe again that this amendment has been checked by the managers of the bill and that they are inclined to support it.
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> Mr. MUSKIE. Mr. President, I have also discussed this amendment with the distinguished Senator from Kentucky. I think it has been worked out in a form I can accept. I am happy to do so. I am willing to yield back the remainder of my time.[5]

EPA and federal courts have consistently interpreted the BACT provisions found in the CAA and the agency's regulations as embodying certain core criteria that require the

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[4] 40 CFR §51.166(b).

[5] 95th Congress, 1st Session (Part 1 of 2) June 10, 1977 Clean Air Act Amendments of 1977 A&P 123 Cong. Record S9421.

permit applicant either to implement the most effective available means for minimizing air pollution or justify its selection of less effective means on grounds consistent with the purposes of the Act. In *Citizens for Clean Air v. EPA*,[6] the Ninth Circuit held that "initially the burden rests with the PSD applicant to identify the best available control." As stated in long-standing EPA guidance, "[r]egardless of the specific methodology used for determining BACT, be it 'top-down,' 'bottom-up,' or otherwise, the same core criteria apply to any BACT analysis: the applicant must consider all available alternatives, and [either select the most stringent of them or] demonstrate why the most stringent should not be adopted."[7] Accordingly, the PSD permit applicant not only must identify all available technologies, including the most stringent, but it must also provide adequate justification for dismissing any available technologies.

Consistent with these core criteria, the EPA's New Source Review (NSR) Workshop Manual establishes that, as the first step in the "top-down" BACT analysis, the applicant *must* consider all "available" control options:

> The first step in a "top-down" analysis is to identify, for the emissions unit in question (the term "emissions unit" should be read to mean emissions unit, process or activity), all "available" control options. Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. Air pollution control technologies and techniques include the application of production process or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the affected pollutant. This includes technologies employed outside of the United States. As discussed later, in some circumstances inherently lower-polluting processes are appropriate for consideration as available control alternatives.[8]

"The term 'available' is used…to refer to whether the technology 'can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term.'"[9] In keeping with the stringent nature of the BACT requirement, EPA has repeatedly emphasized that "available"

> is used in the broadest sense under the first step and refers to control options with a "practical *potential* for application to the emissions unit" under evaluation. . . . The goal of this step is to develop a comprehensive list of control options.[10]

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[6] 959 F.2d 839, 845 (9th Cir. 1992).

[7] Memorandum from John Calcagni, Director of EPA Air Quality Management Division, to EPA Regional Air Directors (June 13, 1989), at 4 (emphasis added).

[8] NSR Manual, at p. B.5 (emphasis added).

[9] In re: Maui Electric Company, PSD Appeal No. 98-2 (EAB September 10, 1998), at 29-30 (quoting NSR Manual at B.17).

[10] In re: Knauf Fiber Glass, PSD Appeal Nos. 98-3 – 98-20 (EAB February 4, 1999), at 12-13 (quoting NSR Manual at B.5) (emphasis added by EAB); see also In re: Steel Dynamics, Inc., PSD Appeal Nos. 99-

EPA adjudicatory decisions also examine the core requirements for the BACT determination process. "Under the top-down methodology, applicants must apply the best available control technology unless they can demonstrate that the technology is technically or economically infeasible. The top-down approach places the burden of proof on the *applicant* to justify why the proposed source is unable to apply the best technology available."[11]

Whatever analytical process is utilized for determining BACT, these core criteria – the requirement to consider all available technologies, including the most stringent, and to provide adequate justification in the administrative record for dismissing any of the technologies based on relevant statutory factors – must be satisfied.

Thus, to conduct a BACT analysis consistent with the requirements of state and federal law, UDAQ and IPP must thoroughly evaluate all available control measures. IGCC is available today. Utah and federal law therefore require that IGCC be thoroughly evaluated as part of the BACT analysis.

Contrary to law, IPP does not properly consider this available method, system, and technique in its BACT analysis because of fundamental flaws in the analysis. The definitions of BACT under Utah and federal law, and the core requirements of the BACT analysis under federal case law, EPA adjudicatory decisions, and the New Source Review Manual, demonstrate that an available technique such as IGCC must be identified and evaluated as a control option in the first step of the BACT analysis. These are minimum core requirements of a state-administered PSD program.

Recent State Actions Requiring Consideration of IGCC Establish Irrefutable Precedence for the Consideration of IGCC.

In March 2003, the State of Illinois required the applicant for a proposed CFB coal-fired electric generation facility to conduct a robust analysis of IGCC as a core element of its BACT analysis:

> Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a 'production process' that can be used to produce electricity from coal. In this regard, the Illinois EPA

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4 and 99-5 (EAB June 22, 2000), at 29 n.24 (citing Knauf with approval); NSR Manual at B.10 ("The objective in step 1 is to identify all control options with potential application to the source and pollutant under evaluation."); id. at B.6 (emphasizing that a proper Step 1 list is "comprehensive").

[11] In re: Spokane Regional Waste-to-Energy Applicant, PSD Appeal No. 88-12 (EPA June 9, 1989), at 9) (internal quotation marks omitted) (emphasis in original); see also In re: Inter-Power of New York, Inc. PSD Appeal Nos. 92-8 and 92-9 (EAB March 16, 1994) ("Under the 'top-down' approach, permit applicants must apply the most stringent control alternative, unless the applicant can demonstrate that the alternative is not technically or economically achievable."); In the Matter of Pennsauken County, New Jersey Resource Recovery Facility, PSD Appeal No. 88-8 (EAB November 10, 1988) ("Thus, the 'top-down' approach shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available.")

> has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.
>
> Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant.[12]

In an ensuing letter, the State of Illinois then formally informed EPA that Illinois has "concluded that it is appropriate for applicants for [proposed coal-fired power plants] to consider IGCC as part of their BACT demonstrations."[13]

Reflecting the viability of IGCC, the State of New Mexico issued a letter on December 23, 2002 requiring the permit applicant (Mustang Energy a subsidiary of Peabody Coal Company) for a proposed new pulverized coal power plant to conduct a site-specific analysis of IGCC as part of the BACT analysis for the proposed facility: "The Department requires a site-specific analysis of IGCC and CFB in order to make a determination regarding BACT for the proposed facility." The New Mexico determination goes on to provide: "The analysis must include a discussion of the technical feasibility and availability of IGCC and CFB for the proposed site in McKinley County, including a discussion of existing IGCC and CFB systems."[14]

On August 29, 2003, New Mexico issued its evaluation of the applicant's response. New Mexico found that the applicant's BACT analysis had in fact indicated that IGCC is commercially available but that the applicant had improperly relied on cost to find that the technology was infeasible:

> Mustang concludes that neither IGCC nor CFB are technically feasible control options for the Mustang site. After careful review of the revised BACT analysis, as well as information gathered from independent sources, the Department determines that Mustang's conclusion is not supported by the evidence. Accordingly, the Department finds that Mustang has not demonstrated the

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[12] Letter from Illinois Division of Air Pollution Control to Jim Schneider, Indeck-Elwood, LLC (March 8, 2003), attached hereto.

[13] Letter from Illinois EPA Director to EPA Regional Administrator, Region V (March 19, 2003), attached hereto.

14 Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Dec. 23, 2002), attached hereto.

technical infeasibility of IGCC and CFB. Moreover, applying the criteria in the NSR Manual, the Department determines that IGCC and CFB are technically feasible at the Mustang site, and must be evaluated in the remaining steps of the top down BACT methodology.

(a) IGCC and CFB are technically feasible at the Mustang site. A technology is considered to be technically feasible if it is commercially available and applicable to the source under consideration. *See* NSR Manual at B.17-18. A technology is commercially available if it has reached a licensing and commercial sales stage of development. *Id.* A technology is applicable if it has been specified in a permit for the same or a similar source type. *Id.* Mustang's revised BACT analysis indicates that IGCC is commercially available, and IGCC has been specified in air quality permits for coal-fired power plants. *See, e.g.,* Lima Energy Facility, 580 megawatt coal-fired power plant. Similarly, CFB is commercially available and has been specified in air quality permits for coal-fired power plants. *See, e.g.,* AES Puerto Rico 454 megawatt coal-fired power plant; Reliant Energy Seward 584 megawatt coal-fired power plant.

(b) For both IGCC and CFB, Mustang improperly relies on cost to determine technical infeasibility. A technology is technically feasible when the resolution of technical difficulties is a matter of cost. *See* NSR Manual at B.19-20. Mustang's revised BACT analysis indicates that the resolution of technical difficulties for both IGCC and CFB are a matter of cost. These costs do not support a finding of technical infeasibility, but may be considered during Step 4 of the top down BACT methodology. *See* NSR Manual at B.26.[15]

It would be arbitrary and capricious were Utah not to likewise require consideration of IGCC as BACT. The December 2002 and August 2003 New Mexico determinations and the March 2003 Illinois determination are attached hereto.

Attached is a memorandum from Vickie Patton of Environmental Defense and Joro Walker of Western Resource Advocates explaining the legal basis for requiring consideration of IGCC in the BACT analysis, which was previously provided to your office.

IPP Failed to Correctly Address IGCC in the BACT Analysis and the Permit Must be Denied. A Properly Conducted BACT Analysis Shows IGCC is BACT for the IPP Project.

[15] Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Aug. 29, 2003), at p. 3, attached hereto.

Appendix I-8 of the NOI contains a top-down BACT analysis which compares the proposed PC plant to both CFB and IGCC plants of similar size. The analysis contains fundamental flaws in both methodology and assumptions, and some significant math errors. These flaws greatly overstate both the cost and the tons of pollutants emitted by IGCC. These errors are compounded by an improper method of calculating incremental costs which, when taken together with the other errors, overstate the incremental costs of pollution removed by the IGCC plant by two orders of magnitude. The main problems with Appendix I-8 are summarized below.

1. The heat rate for IGCC is incorrectly increased for altitude.
   The IGCC heat rate assumed in Appendix I-8 is to be 10,800 Btu/Kw. IPP calculates the heat rate by taking the heat rate for the Polk plant (built in the mid-1990s) and increasing it by 12% to account for derating of the combustion turbines due to the plant site's altitude of 4600 ft MSL.[16] This approach is fundamentally wrong. Attached hereto is a General Electric Gas Turbine Altitude Correction Curve chart that shows how to derate the turbine with altitude. The "notes" to the chart state that the turbine's heat rate does not change with altitude. Conversations with ConocoPhillips confirm that altitude does not change the heat rate of the turbine nor the gasification island to any significant degree.[17] The reason: while there is less oxygen at altitude causing the turbine to produce fewer Kw of electricity relative to sea level, the amount of heat input into the turbine also decreases, and so the overall heat rate stays the same.

   IGCC plants have higher cost of electricity at altitude relative to the same plant at sea level because of both higher Air Separation Unit costs and turbine derating, but these costs must be accounted for differently.

   The appropriate heat rate for an IGCC plant should be what vendors are able to guarantee today, not historic numbers from when Polk Florida was built in the 1990s. For ConocoPhillips E-Gas technology, the heat rate today is around 8637 Btu/Kw. This, or comparable value, is what IPP should have used for the IGCC heat rate in Appendix I-8.

   As a result of using an incorrect heat rate, IPP significantly overstates the costs and emissions from an IGCC unit.

2. IPP uses outdated capital costs for the IGCC plant.
   Appendix I-8 uses the cost of the Polk IGCC plant, built in the early 1990s, to estimate the capital cost of an IGCC plant. This approach fails to account for the

[16] NOI, Appendix I-8, Table 11, page II-21.
[17] Personal Communication between John Thompson CATF and Cliff Keeler of ConocoPhillips, May 18, 2004.

decreased costs of an IGCC plant today. Since Polk was built, numerous IGCC plants have been built at refineries, driving down the cost of IGCC plants in general. A better approach is to use recent cost studies from organizations like EPRI, who undertake detailed cost studies of both PC and IGCC plants for public and private clients. Attached hereto are Tables 16-1 and Table 16-2 from an EPRI report entitled, "Phased Construction of IGCC Plants for CO2 Capture- Effect on Pre-investment." The tables detail costs for a 509 MW net IGCC plant in a New York location without carbon capture. Even after accounting for altitude differences, costs for an IGCC plant of the size required by IPP would only be about $1.1 billion, not the $1.7 billion used by IPP based upon outdated Polk costs.

Reducing the capital costs of the IGCC in Appendix I-8 would significantly lower the annualized costs used in the BACT calculation.

As described later in this document, the Appendix also overstates O & M costs.

3. Annual operating costs calculated in Appendix I-8 for the PC contain a math error that significantly understates costs.
   Appendix I-8 calculates the annual operating costs for the PC in Part II, Appendix B. The relevant table is attached hereto. (7/26/03 Sargent & Lundy, "Part II-PC/CFB/IGCC BACT Determination". The indirect cost category has three items, each equaling $11,080,000, labeled "Property Taxes, Insurance and Administration." However, only two of these three items are actually added to the annual costs for the top-down BACT analysis. As a result, the PC costs are reported as $168,503,000 instead of $179,583.000.[18]

4. The availability of an IGCC plant should be assumed to be over 90% when a spare gasifier is added.
   Appendix I-8 Method states that no IGCC plant has a demonstrated availability above 80%. This conclusion overlooks two facts: 1) the Polk and Wabash IGCC units are only single train gasifiers that have no spare, and 2) Spare gasifiers increase availability to over 90%. Eastman Chemical operates a chemical plant where two gasifiers are used, including a spare. The availability of the gasification operation is over 98%.

5. Appendix I-8 does not accurately capture the values for actual IGCC emissions or recent permit levels for IGCC.
   Appendix I-8 overstates the emissions from IGCC plants. After Appendix I-8 was completed, Wisconsin DNR issued a permit for both SCPC and IGCC units at Elm

[18] The actual costs of the PC for the purposes of the BACT calculation may be closer to $200,000,000/yr. The fixed O&M values for the PC plant may be greatly underestimated. IPP shows these costs to be about $8 /KW-year. In contrast, nationwide, EIA's Annual Energy Outlook -- 2003 projects Fixed Operating and Maintenance costs on new scrubbed plants at $24.52 per kW-year. See Annual Energy Outlook 2003, DOE/EIA-0554(2003), January 2003, page 73.

technology risk of using IGCC is small in comparison to the challenge of the overall financial risks of building any large coal project. As Table 3 shows the economics of IGCC are not that different from a PC.

Step 5. Select BACT

Conclusion: IGCC is BACT for the IPP Project.

UDAQ AND IPSC SHOULD HAVE CONSIDERED A SUPERCRITICAL PULVERIZED COAL BOILER FOR THE NEW UNIT

UDAQ and IPSC should have also considered the construction of a supercritical pulverized coal boiler, rather than the planned subcritical pulverized coal boiler. Supercritical boilers are up to 7% or more efficient than subcritical boilers. Thus, supercritical boilers use less fuel and emit less carbon dioxide emissions. Further, such supercritical boilers achieve up to 17% lower emission rates of carbon monoxide (CO), nitrogen oxides (NOx) and sulfur oxides (SOx), as well as up to 15% lower PM emission rates.[41] For example, Steag has recently submitted a PSD permit application to the U.S. EPA for a supercritical boiler that would achieve an emission limit for SO2 of .06 lbs/MMbtu on a 30 day rolling average (attached). This SO2 emission limit is significantly lower than that being proposed by IPP and can be attributed at least in part to the employment of a supercritical boiler. Xcel Energy is also considering the construction of a supercritical boiler for new proposed unit at its Comanche plant in Pueblo, Colorado.

Thus, UDAQ and IPSC should have evaluated the installation of a supercritical boiler at IPP Unit 3 as an inherently lower emitting process as part of its BACT determination.

THE ITA FAILS TO ADDRESS CARBON DIOXIDE AND OTHER GREENHOUSE GAS EMISSIONS

The ITA for IPP Unit 3 did not address carbon dioxide (CO_2) or other greenhouse gases to be emitted from the new unit. However, such emissions can be quite significant from coal-fired boilers.

We believe that the EPA, and the State of Utah have a legal obligation to regulate CO_2 and other greenhouse gases as pollutants under the Clean Air Act and the Utah Air Conservation Act. Indeed, twelve states, fourteen environmental groups and two cities have filed suit in federal court stating that EPA must regulate greenhouse gas emissions under the Clean Air Act. Specifically, the parties appealed the U.S. EPA's decision to reject a petition that sought to have the federal government regulate greenhouse gas

[41] See attached presentation by Tom Bartolomei, ALSTOM, *Sliding Pressure Supercritical Boilers: Flexible and Efficient Technology for New Coal-Fired Generation*, presented at COAL-GEN, August 1, 2002.

emissions from new motor vehicles.[42] If the federal court agrees that greenhouse gases, such as CO_2, must be regulated under the Clean Air Act, such a decision would also require the establishment of CO_2 emission limits in this permit for IPP Unit 3.

At the minimum, UDAQ must consider emissions of CO2 in its BACT analysis for IPP Unit 3. The federal Environmental Appeals Board (EAB) has interpreted the definition of BACT as requiring consideration of unregulated pollutants in setting emission limits and other terms of a permit, since a BACT determination is to take into account environmental impacts.[43] Attached is a recently issued paper entitled *Considering Alternatives: The Case for Limiting CO2 Emissions from New Power Plants through New Source Review* by Gregory B. Foote that discusses the regulatory background to support consideration of CO2 impacts when permitting a new source and, in particular, a new coal-fired power plant. This paper indicates that it is entirely appropriate to consider CO2 emissions when evaluating environmental impacts under the new source review permit program, and the paper also provides suggested approaches for evaluating technologies in terms of CO2 emissions.

Similarly, Utah state law also supports regulation of greenhouses gases under the minimum federal requirements and state law. The purposes of the Utah Air Conservation Act is to "provide for a coordinated statewide program for air pollution prevention, abatement, and control." Utah Code Ann. § 19-2-101(4)(a). The term air pollution "means the presence in the ambient air of one or more air contaminants in such quantities and duration and under conditions and circumstances, as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonable interfere with the enjoyment of life or use of property as determined by the standards, rules, and regulations adopted by the Air Quality Board (Section 19-2-104)." Utah Admin. Rule R307-101-2; Utah Code Ann. § 19-2-102. The State of Utah Division of Air Quality has recognized that "the consensus of most scientists worldwide is that increasing concentrations of greenhouse gases will lead to significant climate warming, shifts in precipitation patterns, and rising sea levels, although the magnitude, timing, and regional patterns of these changes cannot be accurately predicted at this time." Utah Division of Air Quality, *Greenhouse Gas Inventory-1990 and 1993,* available at www.airquality.utah.gov/PLANNING/Grnhsgas.htm. Accordingly, existing state legal authority supports the regulation of greenhouses gases by UDAQ in this permit.

UDAQ AND IPSC SHOULD HAVE EVALUTED THE USE OF K-FUELS

The UDAQ failed to evaluate the use of K-Fuels at IPP Unit 3 as an option for inherently lower criteria pollutant emissions as well as mercury emissions. K-fuel is coal that is treated by a pre-combustion process that improves the quality of the coal, increasing the heat content of the coal, and removing some of the sulfur and NOx precursors as well as mercury. The first K-fuel production plant is being built at the Black Thunder Mine in

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[42] Commonwealth of Massachusetts, et al. v. U.S. EPA, No. 03-1361 (Consolidated with Nos. 03-1362-1368) U.S. Court of Appeals for the District of Columbia Circuit.

[43] See *In Re North County Resource Recovery Associates*, 2 E.A.D. 229, 230 (Adm'r 1986), 1986 EPA App. LEXIS 14.

Mercury (Hg):

Mercury is a natural trace constituent of coal. Depending on the source of the coal the mercury content of the coal may vary. MidAmerican intends to use Powder River Basin coal in CBEC Unit #4. Coal analyses for selected Powder River Basin coals were submitted by MidAmerican in a response dated December 26, 2002. These analyses show that the maximum mean mercury content from any source is 0.1 ppmw. The annual average mercury content should be below this number. However, because there are multiple sources of coal and it is not known how much coal will be received from each of these sources, it is impossible to predict an accurate value for the annual average mercury content. Therefore, the annual emissions of 0.34 tons per year were determined using 0.1 ppmw mercury. This is the average mercury concentration reported from the Wyodak mine.

The results of a review of the population of electric utility steam generating units showed that there were currently no units that have installed and are continuously operating any control system specifically for the removal of mercury from the exhaust gases. However, the control equipment employed to remove other pollutants like SO_2 and PM/PM_{10} does remove some of the mercury from the exhaust gas. The available data on mercury removal is limited. USEPA has required several units to perform sampling to determine the mercury emissions from coal fired boilers. This data is available to the public on USEPA's website at http://www.epa.gov/ttn/atw/combust/utiltox/icrdata.xls. This data set is referred to as the ICR data. There are a couple of flaws in this data set. First, the data only represents one-time emissions sampling data. The results would represent what was being achieved at that moment in time. However, it appears that coal chemistry, chlorine content specifically, does affect the ability of existing control equipment to remove mercury from exhaust streams. The ICR data does not address the coal variability at any given site. Furthermore, the results from several of the facilities show negative reductions in emissions. In other words, the emissions of mercury out the control equipment were greater than the emissions out of the furnace. Based on these two points, the Department has concluded that the ICR data does not sufficiently address the emissions limitations that are achieved in practice by other units. Therefore, the Department will not use this information in determining a MACT floor emission rate. Since there are no existing units operating with control specifically for mercury control, but rather are simply removing mercury as a co-benefit to the control of SO_2 and PM/PM_{10}, the Department has concluded that the co-benefits from the SO_2 and PM/PM_{10} control is the MACT floor.

One technology has been identified as a potential beyond-the-floor control for mercury. That technology is sorbent injection. To date, the only commercially available system uses activated carbon as the sorbent injected in the system. However, research continues on other materials that could be used as sorbents in an injection system to remove mercury. The applicant has agreed to install a sorbent injection system to remove the mercury from the exhaust of this unit. For purposes of this review, the Department will consider the system to be using activated carbon as the sorbent. The applicant would like to have the ability to explore other materials should they become commercially available before the unit begins operation. The permit allows for an optimization study of the system. The type of sorbent used will be evaluated during this test period. Several field tests have been completed at different facilities to determine the efficiency of sorbent injection systems on the removal of mercury. Unfortunately, in

Considering Alternatives: The Case for Limiting CO2 Emissions from New Power Plants Through New Source Review

by Gregory B. Foote, Assistant General Counsel,
U.S. Environmental Protection Agency

The author is presently detailed to the Center for International Environmental Law (CIEL) in Washington, D.C. The views expressed in this Article and explanatory materials are solely those of the author and do not reflect the position of EPA or CIEL.

Expanded Outline

INTRODUCTION

For the first time in decades, power companies are planning to build large numbers of new coal-fired plants in the United States. Under business as usual, these plants – the largest emitters of greenhouse gases (they make up 1/3 of total U.S. CO2 emissions) – will emit hundreds of millions of tons over their lifetime. This will add to already-unacceptable levels of CO2 emissions. The United States' greenhouse gas emissions are 12% higher than at the time of adoption of the United Nations Framework Convention on Climate Change and are expected to increase by another 30% in the next 20 years. These new plants would come at a time when the Bush Administration acknowledges the need for drastic reductions in CO2 in order to stabilize greenhouse gases at a level that might avoid the worst environmental consequences of climate change. In the wake of the rejection of the Kyoto Protocol and the absence of any comprehensive program to limit greenhouse gases, it is necessary to look to all available mechanisms to make progress on climate change.

I. "Prevention of Significant Deterioration" and "New Source Review" Permitting Requirements of the CAA

A. The Requirement for Reasoned Decisionmaking

This section introduces two key tenets of administrative law that underlie the Article's entire analysis. First, the "arbitrary and capricious" standard of judicial review requires agencies to make reasonable decisions. Second, what is reasonable, and the amount of discretion afforded to an agency, depends on the circumstances presented. These principles were recently reaffirmed by the Supreme Court in *Alaska Department of Environmental Conservation v. EPA*, which struck down a state BACT decision as unreasonable.

B. The Basic Statutory and Regulatory Framework.

This section outlines the NAAQS/SIP system under the CAA and the role of NSR within it, as well as the basic applicability criteria of NSR.

* NSR matters, despite "NSR Reform" and legislative proposals. Many of the planned new coal-fired power plants are expansions of existing plants or entirely new

* The statute explicitly requires that alternative "production processes," clean fuels," and "innovative fuel combustion techniques" be taken into account in setting BACT.

1. The Choice of Fuels.

This section explains that "Clean fuels" are specified in the BACT definition and must be considered a mandatory element of the decisionmaking process. These include inherently lower-polluting fuels (e.g., gas vs. coal) and cleaner forms of the same fuel (e.g., lower-sulfur coal).

2. The Choice of Production Processes.

This section explains the need to consider alternate production processes under NSR.

* The choice of production process can substantially affect emissions of NAAQS pollutants, toxics, and CO2.
* IGCC is a commercially available production technology for coal-fired plants that has several advantages over older technologies. It has lower emissions rates; greater thermal efficiency, which also reduces emissions; the ability to produce hydrogen for fuel cells; and the ability to separate CO2 emissions for geologic storage when that technology becomes available.

C. Production Efficiency as a Component of BACT and LAER.

This section discusses production efficiency as an element of the NSR control technology analysis.

* Considering production efficiency in determining BACT and LAER can substantially reduce emissions. Emissions limits are typically measured on a fuel or material "input" basis with little regard for total emissions. Measuring limits on an "output" basis – e.g., based on tons of emissions per MWh of electricity produced rather than mmbtu of heat input – reveals that some production processes are more efficient, resulting in lower emissions.
* More efficient processes, with lower total emissions, are more cost-effective than less efficient options. The affordability criterion that is the main driver of BACT and LAER decisions is calculated on a dollars-per-ton-of-pollutant-removed measurement of cost-effectiveness. Measuring emissions on an output basis improves the cost-effectiveness of more efficient technologies.
* More efficient processes cannot serve as a substitute for add-on controls. BACT and LAER must consider the lowest-emitting combination of all pollution reduction methods. Thus, enhanced production efficiency cannot substitute for end-of-stack controls, although its cost can be taken into account.

IV. The Case for Construction of a Truly Clean Coal-Fired Power Plant that Uses IGCC Technology to Minimize Emissions of All Pollutants and Offsets CO2 Emissions

This section outlines the case for weighing an application to construct a coal-fired power plant in light of its CO2 emissions.

A. Why CO2 Emissions Should Be Considered in NNSR and PSD Permitting.

1. The CAA Requires that New Source Review Permit Decisions Take into Account Emissions of "Unregulated" Pollutants Such as CO2 That Have Significant Adverse Environmental Impacts; EPA's Determination That CO2 Is Not an "Air Pollutant" Does Not Affect This Obligation.

This section discusses why EPA's 2003 EPA denial of a petition to regulate CO2 does not alter the case for limiting CO2 via NSR.

* EPA's August 2003 petition response declining to adopt mandatory, comprehensive regulation of CO2 under the CAA has no effect on NSR. The policy, legal, and factual premises of the petition denial are consistent with addressing CO2 through individual NSR permits.

** Policy concerns are not implicated. The petition response was expressly driven by concerns over the huge political and economic consequences of adopting a NAAQS or other comprehensive regulation. In contrast, the Bush Administration has spoken favorably about individual state initiatives on CO2, and using NSR as suggested is fully compatible with that position.

** Legal issues are not implicated. The conclusion in the petition response that CO2 is not an "air pollutant" at all under the CAA simply reasoned backwards from the decision not to regulate and has no implications for NSR. Consideration of CO2 in NSR is not dependent on CO2's status under the CAA but rather on its function as cause of adverse environmental impacts.

** Factual issues are not implicated. The petition response did nothing to question the official U.S. position, as spelled out in *Climate Action Report 2002*, that anthropogenic CO2 emissions cause substantial adverse health and welfare effects

2. Emissions of CO2 Result in Significant, Adverse Environmental Impacts that Merit Careful Consideration in New Source Review Permitting.

This section explains that principles of reasoned decisionmaking should limit agency discretion in considering CO2, since the emissions cause harmful environmental impacts, other regulatory mechanisms are generally lacking, and limiting CO2 through NSR can effectively mitigate those impacts.

a. CO2 Emissions Are Extremely Harmful.

* The United States shares the general consensus that CO2 is a cause of climate change. The United States agrees that manmade emissions of CO2 and other greenhouse damage are a cause of climate change, which in turn will cause extensive environmental harm.

* The fact that climate change is a cumulative problem should not obscure that power plants contribute to the problem. Even power plants – the largest emitters of greenhouse gases – contribute relatively little to climate change on their own. As with other air pollution issues, however, the contribution of large individual emitters to the cumulative problem cannot be excused or overlooked.

b. There Is an Absence of Other Regulatory Mechanisms to Address CO2 Emissions.

* CO2 represents a far greater regulatory gap than any other unregulated pollutant. Environmental impacts of CO2 from power plants should be considered in NSR permitting under the same basic framework that other "unregulated pollutants" have been for over 15 years. Under that framework, CO2 merits far greater consideration than has been needed with respect to other unregulated pollutants because other regulatory mechanisms to address the problem of CO2 generally are lacking.

c. New Source Review Can Effectively Mitigate the Adverse Environmental Impacts of CO2 Emissions.

* NSR mechanisms can limit CO2 emissions and resulting environmental harm. The use of IGCC technology as a result of NSR permitting would limit CO2 emissions through its greater thermal efficiency. Residual CO2 emissions can be further limited by requiring that these emissions be offset through the NSR permit.

B. How CO2 Emissions Should Be Considered in New Source Review Permitting.

This section explains in greater detail how the NSR permitting process should address emissions of CO2.

1. Use of IGCC Technology as a Production Process.

This section outlines the reasons favoring use of IGCC as a production process technology to limit CO2 emissions.

* Even before considering CO2, there are many other factors suggesting that IGCC should be used. Taking thermal efficiency into account by measuring emissions of NAAQS pollutants on an output basis improves IGCC's cost-effectiveness, as does considering its ability to vastly reduce mercury emissions.

* The adverse impacts of CO2 emissions should also be taken into account. Considering the impact of CO2 emissions on climate change militates in favor of using IGCC.

* The likelihood of mandatory CO2 regulation early in the lifespan of a new coal-fired plant suggests that IGCC should be utilized to minimize future regulatory and financial risks. These risks affect how the cost of limiting emissions of regulated NAAQS pollutants from a new plant built today may be affected by future CO2 regulation. A company's failure to mitigate those risks now may saddle states and ratepayers with excess costs in the future.

2. CO2 Offsets as a Permit Condition.

* States are authorized to require CO2 offsets as a way of mitigating environmental harm. Although emissions offsets are only mandated for NAAQS pollutants, states are authorized to requirement more broadly to avoid environmental harm from a new source.

* Building new coal-fired plants only on a "pay as you go" basis by requiring CO2 offsets is appropriate. EPA first required offsets in 1976 when there was no effective air quality planning mechanism to address emissions of NAAQS pollutants from new sources. A similar situation exists today regarding CO2 due to the lack of a comprehensive climate change program.

* Many offset opportunities are available, including market mechanisms. There are numerous available means of satisfying a CO2 offset requirement. Oregon and Washington, for example, have regulatory programs that could be emulated which provide a range of choices, including market mechanisms.

3. Action to Minimize and Offset CO2 Emissions from New Sources Addresses Climate Change and Sustainable Development Obligations under International Law.

* Limiting CO2 emissions through NSR would help to satisfy U.S. obligations under the United Nations Framework Convention on Climate Change (UNFCCC). The Bush Administration has reaffirmed U.S. commitment to the UNFCCC and its goal of stabilizing greenhouse gas emissions at acceptable levels. By minimizing and offsetting CO2 emissions from new plants, the United States would help make progress towards meeting this goal.

* CO2 limits on new sources would help fulfill sustainable development obligations. The Bush administration has reiterated support for the sustainable development principles set out in the 1992 Rio Declaration. It has also acknowledged that "sustainable development must begin at home." CO2 limits on power plants would help fulfill these goals.

V. Available Remedies When Reasoned Decisionmaking Is Lacking in New Source Review

This section is an appendix that summarizes the range of legal remedies available to address deficient NSR permit decisions when states fail to satisfy their obligations for reasoned decisionmaking.

* Both state and federal remedies are available, and intended to insure that permitting authorities make decisions that are reasonable, not "arbitrary and capricious." A range of federal remedies under the Administrative Procedure act and analogs under

NSR

Concerned Citizens of Venice
Friends of Sevier
Utah Chapter Sierra Club
Wasatch Clean Air Coalition
Rocky Mountain Office of Environmental Defense
Western Resource Advocates
Clean Air Task Force

October 17, 2003

Rick Sprott
Utah Department of Environmental Quality
Director, Utah Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84116

Re: Comments on NEVCO Energy Company's PSD Permit Application for the Sevier Power Company Project (September 2003)

Dear Mr. Sprott:

The Concerned Citizens of Venice, Friends of Sevier, Utah Chapter of the Sierra Club, Wasatch Clean Air Coalition, Rocky Mountain Office of Environmental Defense, Western Resource Advocates and Clean Air Task Force, respectfully provide the following comments on NEVCO Energy Company's September 2003 Prevention of Significant Deterioration Permit Application (Application) for the Sevier Power Company (SPC) Project. We believe it would be contrary to law and harmful to Utah's air quality for the Utah Department of Environmental Quality to determine that the application materials are complete or to provide public notice of the state's intent to approve the proposed construction of this facility without first addressing the serious deficiencies examined in detail below. We greatly appreciate your consideration of our views.

FEDERAL AND STATE CLEAN AIR LAWS REQUIRE NEVCO TO CONSIDER THE APPLICATION OF PRODUCTION PROCESSES AND AVAILABLE

METHODS, SYSTEMS AND TECHNIQUES TO LOWER AIRBORNE CONTAMINANTS.

Integrated Gasification Combined Cycle (IGCC) is an available, demonstrated clean coal combustion technology with significant emission reduction benefits. There are numerous benefits to IGCC, including fewer emissions of criteria and hazardous air pollutants, the opportunity for capturing greenhouse gases, such as CO2, that cause global warming, and a general increase in efficiency over other coal burning technologies. Because NEVCO solely focused on Circulating Fluidized Bed (CFB) coal combustion and did not consider IGCC in the SPC BACT analysis, the Utah Division of Air Quality (UDAQ or Division) must direct the applicant to thoroughly evaluate IGCC as part of the BACT analysis. Indeed, the state has a duty as part of the core of the BACT determination process to provide a reasoned justification for rejecting an available control technology.

Utah and Federal Law Require a Thorough Evaluation of IGCC Cleaner Coal Combustion Technology as Part of the BACT Analysis.

Section 165(a)(4) of the Clean Air Act (CAA) provides that "no major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless…the facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility."[1] The requirement for conducting a BACT analysis is codified at 40 CFR § 51.166(j), in regulations setting forth the requirements for state-administered PSD programs. Utah law, in turn, requires that an approval order may be issued only if "[t]he degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology. . ."[2]

BACT is then defined under Utah law as follows:

> [A]n emission limitation and/or other controls to include design, equipment, work practice, operation standard or combination thereof, based on the maximum degree of reduction of each pollutant subject to regulation under the Clean Air Act and/or Utah Air Conservation Act emitted from or which results from any emitting installation, which the Air Quality Board, on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable for such installation through the application of production processes and available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant.[3]

The wording of the definition of BACT found within Utah's regulations is similar to the federal definition at 40 CFR § 51.166(b)(12). Indeed, Utah's definition of BACT must

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[1] 42 U.S.C. §7475(a)(4).
[2] UT Air Quality Rules 307-401-6(1) (hereinafter "UT AQR").
[3] UT AQR 307-101-2.

be consistent with the SIP requirements under federal regulations, which provide that "[a]ll State plans shall use the following definitions for the purposes of this section. Deviations from the following wording will be approved only if the State specifically demonstrates that the submitted definition is more stringent, or at least as stringent, in all respects" as the federal definitions.[4] Thus, the BACT requirement must be implemented and construed under Utah law at least as strictly as EPA and the federal courts have construed it.

This definition includes coal gasification. The legislative history of the amendment adding the term "innovative fuel combustion techniques" to the Clean Air Act's definition of "BACT" is clear. Coal gasification must be considered. The relevant passage of the debate is excerpted below:

> Mr. HUDDLESTON. Mr. President, the proposed provisions for application of best available control technology to all new major emission sources, although having the admirable intent of achieving consistently clean air through the required use of best controls, if not properly interpreted may deter the use of some of the most effective pollution controls. The definition in the committee bill of best available control technology indicates a consideration for various control strategies by including the phrase "through application of production processes and available methods systems, and techniques, including fuel cleaning or treatment." And I believe it is likely that the concept of BACT is intended to include such technologies as low Btu gasification and fluidized bed combustion. But, this intention is not explicitly spelled out, and I am concerned that without clarification, the possibility of misinterpretation would remain. It is the purpose of this amendment to leave no doubt that in determining best available control technology, all actions taken by the fuel user are to be taken into account--be they the purchasing or production of fuels which may have been cleaned or up-graded through chemical treatment, gasification, or liquefaction; use of combustion systems such as fluidized bed combustion which specifically reduce emissions and/or the post-combustion treatment of emissions with cleanup equipment like stack scrubbers. The purpose, as I say, is just to be more explicit, to make sure there is no chance of misinterpretation. Mr. President, I believe again that this amendment has been checked by the managers of the bill and that they are inclined to support it.
>
> Mr. MUSKIE. Mr. President, I have also discussed this amendment with the distinguished Senator from Kentucky. I think it has been worked out in a form I can accept. I am happy to do so. I am willing to yield back the remainder of my time.[5]

EPA and federal courts have consistently interpreted the BACT provisions found in the CAA and the agency's regulations as embodying certain core criteria that require the permit applicant either to implement the most effective available means for minimizing

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[4] 40 CFR §51.166(b).

[5] 95th Congress, 1st Session (Part 1 of 2) June 10, 1977 Clean Air Act Amendments of 1977 A&P 123 Cong. Record S9421.

air pollution or justify its selection of less effective means on grounds consistent with the purposes of the Act. In *Citizens for Clean Air v. EPA*,[6] the Ninth Circuit held that "initially the burden rests with the PSD applicant to identify the best available control." As stated in long-standing EPA guidance, "[r]egardless of the specific methodology used for determining BACT, be it 'top-down,' 'bottom-up,' or otherwise, the same core criteria apply to any BACT analysis: the applicant must consider all available alternatives, and [either select the most stringent of them or] demonstrate why the most stringent should not be adopted."[7] Accordingly, the PSD permit applicant not only must identify all available technologies, including the most stringent, but it must also provide adequate justification for dismissing any available technologies.

Consistent with these core criteria, the EPA's New Source Review (NSR) Workshop Manual establishes that, as the first step in the "top-down" BACT analysis, the applicant *must* consider all "available" control options:

> The first step in a "top-down" analysis is to identify, for the emissions unit in question (the term "emissions unit" should be read to mean emissions unit, process or activity), all "available" control options. Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. Air pollution control technologies and techniques include the application of production process or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the affected pollutant. This includes technologies employed outside of the United States. As discussed later, in some circumstances inherently lower-polluting processes are appropriate for consideration as available control alternatives.[8]

"The term 'available' is used…to refer to whether the technology 'can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term.'"[9] In keeping with the stringent nature of the BACT requirement, EPA has repeatedly emphasized that "available"

> is used in the broadest sense under the first step and refers to control options with a "practical *potential* for application to the emissions unit" under evaluation. . . . The goal of this step is to develop a comprehensive list of control options.[10]

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[6] 959 F.2d 839, 845 (9th Cir. 1992).

[7] Memorandum from John Calcagni, Director of EPA Air Quality Management Division, to EPA Regional Air Directors (June 13, 1989), at 4 (emphasis added).

[8] NSR Manual, at p. B.5 (emphasis added).

[9] In re: Maui Electric Company, PSD Appeal No. 98-2 (EAB September 10, 1998), at 29-30 (quoting NSR Manual at B.17).

[10] In re: Knauf Fiber Glass, PSD Appeal Nos. 98-3 – 98-20 (EAB February 4, 1999), at 12-13 (quoting NSR Manual at B.5) (emphasis added by EAB); see also In re: Steel Dynamics, Inc., PSD Appeal Nos. 99-

EPA adjudicatory decisions also examine the core requirements for the BACT determination process. "Under the top-down methodology, applicants must apply the best available control technology unless they can demonstrate that the technology is technically or economically infeasible. The top-down approach places the burden of proof on the *applicant* to justify why the proposed source is unable to apply the best technology available."[11]

Whatever analytical process is utilized for determining BACT, these core criteria – the requirement to consider all available technologies, including the most stringent, and to provide adequate justification in the administrative record for dismissing any of the technologies based on relevant statutory factors – must be satisfied.

Thus, to conduct a BACT analysis consistent with the requirements of state and federal law, NEVCO must thoroughly evaluate all available control measures. IGCC is available today. Utah and federal law therefore require that IGCC be thoroughly evaluated as part of the BACT analysis.

Contrary to law, NEVCO does not consider this available method, system, and technique in its BACT analysis but instead focuses exclusively on CFB. The definitions of BACT under Utah and federal law, and the core requirements of the BACT analysis under federal case law, EPA adjudicatory decisions, and the New Source Review Manual, demonstrate that an available technique such as IGCC must be identified and evaluated as a control option in the first step of the BACT analysis. These are minimum core requirements of a state-administered PSD program.

Recent State Actions Requiring Consideration of IGCC Establish Irrefutable Precedence for the Consideration of IGCC.

In March 2003, the State of Illinois required the applicant for a proposed CFB coal-fired electric generation facility to conduct a robust analysis of IGCC as a core element of its BACT analysis:

> Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a 'production process'

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4 and 99-5 (EAB June 22, 2000), at 29 n.24 (citing Knauf with approval); NSR Manual at B.10 ("The objective in step 1 is to identify all control options with potential application to the source and pollutant under evaluation."); id. at B.6 (emphasizing that a proper Step 1 list is "comprehensive").

[11] In re: Spokane Regional Waste-to-Energy Applicant, PSD Appeal No. 88-12 (EPA June 9, 1989), at 9) (internal quotation marks omitted) (emphasis in original); see also In re: Inter-Power of New York, Inc. PSD Appeal Nos. 92-8 and 92-9 (EAB March 16, 1994) ("Under the 'top-down' approach, permit applicants must apply the most stringent control alternative, unless the applicant can demonstrate that the alternative is not technically or economically achievable."); In the Matter of Pennsauken County, New Jersey Resource Recovery Facility, PSD Appeal No. 88-8 (EAB November 10, 1988) ("Thus, the 'top-down' approach shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available.")

> that can be used to produce electricity from coal. In this regard, the Illinois EPA has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.
>
> Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant.[12]

In an ensuing letter, the State of Illinois then formally informed EPA that Illinois has "concluded that it is appropriate for applicants for [proposed coal-fired power plants] to consider IGCC as part of their BACT demonstrations."[13]

Reflecting the viability of IGCC, the State of New Mexico issued a letter on December 23, 2002 requiring the permit applicant (Mustang Energy a subsidiary of Peabody Coal Company) for a proposed new pulverized coal power plant to conduct a site-specific analysis of IGCC as part of the BACT analysis for the proposed facility: "The Department requires a site-specific analysis of IGCC and CFB in order to make a determination regarding BACT for the proposed facility." The New Mexico determination goes on to provide: "The analysis must include a discussion of the technical feasibility and availability of IGCC and CFB for the proposed site in McKinley County, including a discussion of existing IGCC and CFB systems."[14]

On August 29, 2003, New Mexico issued its evaluation of the applicant's response. New Mexico found that the applicant's BACT analysis had in fact indicated that IGCC is commercially available but that the applicant had improperly relied on cost to find that the technology was infeasible:

> Mustang concludes that neither IGCC nor CFB are technically feasible control options for the Mustang site. After careful review of the revised BACT analysis, as well as information gathered from independent sources, the Department

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[12] Letter from Illinois Division of Air Pollution Control to Jim Schneider, Indeck-Elwood, LLC (March 8, 2003), attached hereto.

[13] Letter from Illinois EPA Director to EPA Regional Administrator, Region V (March 19, 2003), attached hereto.

14 Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Dec. 23, 2002), attached hereto.

determines that Mustang's conclusion is not supported by the evidence. Accordingly, the Department finds that Mustang has not demonstrated the technical infeasibility of IGCC and CFB. Moreover, applying the criteria in the NSR Manual, the Department determines that IGCC and CFB are technically feasible at the Mustang site, and must be evaluated in the remaining steps of the top down BACT methodology.

(a) IGCC and CFB are technically feasible at the Mustang site. A technology is considered to be technically feasible if it is commercially available and applicable to the source under consideration. *See* NSR Manual at B.17-18. A technology is commercially available if it has reached a licensing and commercial sales stage of development. *Id.* A technology is applicable if it has been specified in a permit for the same or a similar source type. *Id.* Mustang's revised BACT analysis indicates that IGCC is commercially available, and IGCC has been specified in air quality permits for coal-fired power plants. *See, e.g.*, Lima Energy Facility, 580 megawatt coal-fired power plant. Similarly, CFB is commercially available and has been specified in air quality permits for coal-fired power plants. *See, e.g.*, AES Puerto Rico 454 megawatt coal-fired power plant; Reliant Energy Seward 584 megawatt coal-fired power plant.

(b) For both IGCC and CFB, Mustang improperly relies on cost to determine technical infeasibility. A technology is technically feasible when the resolution of technical difficulties is a matter of cost. *See* NSR Manual at B.19-20. Mustang's revised BACT analysis indicates that the resolution of technical difficulties for both IGCC and CFB are a matter of cost. These costs do not support a finding of technical infeasibility, but may be considered during Step 4 of the top down BACT methodology. *See* NSR Manual at B.26.[15]

It would be arbitrary and capricious were Utah not to likewise require consideration of IGCC as BACT. The December 2002 and August 2003 New Mexico determinations and the March 2003 Illinois determination are attached hereto.

IGCC Must be Considered in the BACT Analysis.

IGCC is an available method, system and technique for curbing air pollutants from the proposed SPC project consistent with Utah's definition of BACT.[16]

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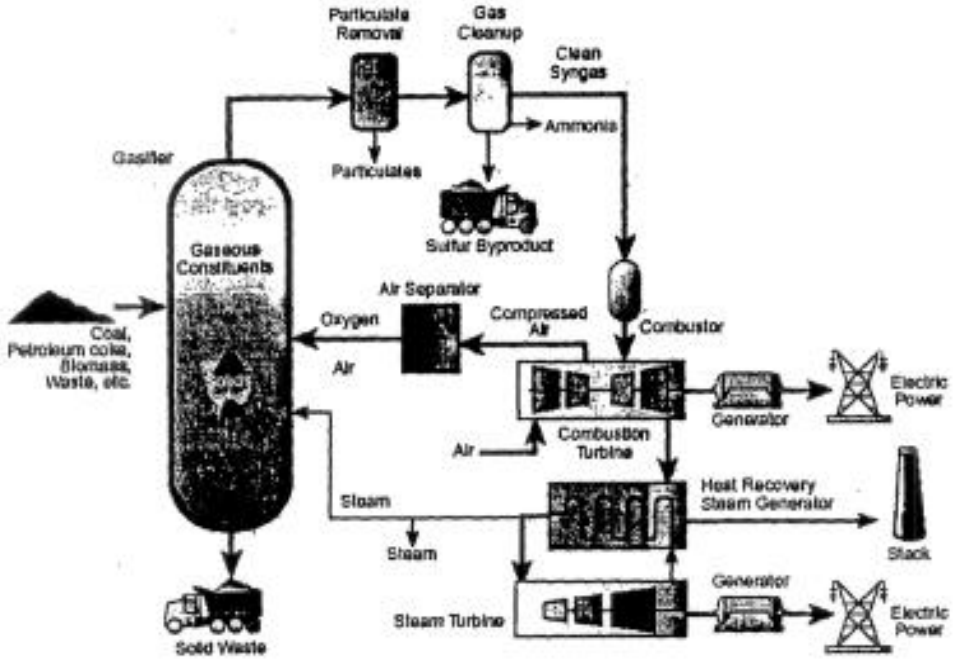
[15] Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Aug. 29, 2003), at p. 3, attached hereto.

[16] UT AQR 307-101-2.

Electricity generation from coal using IGCC technology is a commercially available and proven process. IGCC units generate electricity by integrating a coal gasifier with combined cycle (combustion turbine and steam turbine) electricity generation equipment (see figure below).



Two full scale commercial IGCC electric generating units are in operation in the United States: Tampa Electric Company's 262 MW unit at the Polk plant in Florida and Cinergy's 192 MW unit at the Wabash River plant in Indiana, which both rely on coal as a fuel source.[17] Two other coal-based IGCC plants operate in Europe, NUON/Demkolec is a 253 MW plant in the Netherlands, and ELCOGAS in Spain is 298 MW.[18] IGCC units can be constructed with multiple gasifiers to achieve unit availability at levels comparable to those of conventional baseload facilities. For instance, the Eastman Chemical plant in Kingsport, Tennessee has utilized a dual-gasifier design to produce chemicals from syngas and has experienced 98 percent availability since 1986.[19] ChevronTexaco claims that its new Standard Project Initiative Reference IGCC Plant achieves greater than 90% availability by using multiple gas trains.[20]

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[17] Resource Systems Group, Inc., EPIndex. See www.epindex.com

[18] Major Environmental Aspects of Gasification-Based Power Generation Technologies, Dec 2002, Table 1-7, page 1-26.

[19] Smith, R.G., "Eastman Chemical Plant Kingsport Plant Chemicals from Coal Operations,1983-2000," 2000 Gasification Technologies Conference.

[20] O'Keefe, L. and Sturm, K., "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," presentation to the 2002 Gasification Technologies Conference, October 2002.

Worldwide there are 131 gasification projects in operation with a combined capacity equivalent to 23,750 MW of IGCC units.[21] An additional 31 projects are planned that would increase this capacity by more than 50 percent.[22] Although not all of these projects produce electricity from coal, they demonstrate widespread commercial application of gasification technology for fuel processing, one of two key components of an IGCC plant. The second component is a combined cycle electricity generating system, which is now commonplace for new natural gas fired power plants.

IGCC units are available from major well-known vendors. Coal gasification equipment is available from ChevronTexaco, Shell, and Global Energy, while major turbine manufacturers, including GE and Siemens-Westinghouse, provide combined cycle generators designed to run on the synthesis gas produced by coal gasifiers. Engineers from Texaco, Jacobs Engineering, and GE have teamed up to offer a standardized IGCC design.[23] James Childress, the Executive Director of the Gasification Technology Council, provided testimony to the U.S. Senate Environment and Public Works Committee stating, "[g]asification is a widely used commercially proven technology."[24] At the same hearing, Edward Lowe, Gas Turbine-Combined Cycle Product Line Manager for General Electric Power Systems, stated that, "IGCC is inherently less polluting and more efficient than any other coal power generation technology."[25] Likewise, the National Coal Council, in a May 2001 report, confirms that IGCC is "viable, commercially available technology."[26] ChevronTexaco, in an October 2002 presentation, states that, "IGCC is a current viable choice for clean coal capacity."[27] And the Center for Energy and Economic Development (CEED) states that, "IGCC technology is available for deployment today."[28]

IGCC's Environmental Performance is Superior to CFB for Generating Electricity from Coal.

The coal gasification fuel-processing step in IGCC power plants results in superior environmental performance and lower emissions compared to the CFB technology that is proposed for SPC. Gasifying coal at high pressure prior to combustion facilitates removal

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[21] Simbeck, Dale, SFA Pacific Inc. Gasification Technology Update, presented to the European Gasification Conference, April 8-10, 2002. The total capacity is based on output of synthesis gas. Many of these projects produce chemicals in addition to or instead of electricity.
[22] Id.
[23] O'Keefe, Luke, et al. A Single IGCC Design for Variable CO_2 Capture.
[24] Childress, James M. Statement Submitted for the Record, Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.
[25] Lowe, Edward. *Outlook on Integrated Gasification Combined Cycle (IGCC) Technology*. Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.
[26] National Coal Council, Increasing Electricity Availability from Coal-Fired Power Plants in the Near Term, p. 20 (May 2001).
[27] "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," Luke O'Keefe and Karl Sturm (ChevronTexaco), October 28, 2002, p. 8.
[28] See www.ceednet.org/fueling/investing.asp

of pollutants that would otherwise be released into the air. According to James Childress, "...criteria pollutant emissions for a coal-based IGCC plant are well below those of even the most modern pulverized coal plants with post combustion cleanup."[29]

IGCC also has several other environmental advantages beyond its reductions in criteria pollutants. Mercury and carbon dioxide (CO_2) removal is easier and less expensive at IGCC units than at other coal-fired plants. Because an IGCC plant is typically 10 to 15 percent more efficient in terms of heat rate compared to a CFB unit,[30] CO_2 emissions -- the primary greenhouse gas responsible for anthropogenic contributions to global warming -- are also reduced by that same amount. In addition, the concentrated CO_2 in the pre-combustion gas stream can be captured and sequestered at a fraction of the cost of post-combustion carbon capture and sequestration other coal plants. The reduced CO_2 emissions rate has important environmental benefits in addressing the urgent problem of global climate change and also reduces increased costs due to future climate change regulations. Even if Utah accepts EPA's recent reversed opinion that CO_2 is not an air pollutant regulated under the Clean Air Act, a position we vigorously disagree with, Utah has a manifest duty under both federal and state law to consider the environmental impacts in determining BACT. The consideration of CO_2 and global warming is most certainly an environmental impact.

Furthermore, mercury removal rates of greater than 90 percent can also be achieved using currently available control technologies with IGCC. DOE states that "an IGCC power plant has the potential of achieving very high mercury removal performance with established technology" and mercury removal in an IGCC power plant can be expected to be very high in removal effectiveness, low in cost, and reliable in design."[31] We examine the mercury pollution control benefits of IGCC in more detail below.

Also, the vitrified solid waste created by IGCC has a number of marketable uses, thereby potentially reducing some of the solid waste disposal issues associated with coal combustion. Indeed, IGCC plants produce 30-50% less solid waste than CFB plants.[32] Again, Utah has a duty under federal and state law to consider the environmental impacts of the solid waste associated with different technology options.

When IGCC permit levels for NOx and PM are compared to SPC's proposed permit levels from the CFB unit, it is clear that IGCC achieves more stringent emission rates.[33]

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[29] Childress, James M. Statement Submitted for the Record, Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.
[30] Major Environmental Aspects of Gasification-Based Power Generation Technologies, US DOE, December 2002, Table 1-7, Page 1-26.
[31] "The Cost of Mercury Removal in an IGCC Plant," US DOE, NETL, September 2002 at 1-2.
[32] Major Environmental Aspects of Gasification-Based Power Generation Technologies, US DOE, December 2002, Table 1-7, Page 1-27.
[33] See also "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," Luke O'Keefe and Karl Sturm (ChevronTexaco), October 28, 2002, p. 30-42.

	Permit Levels (lb/MMBtu)			
Pollutant	SPC	Kentucky Pioneer (1)	Lima (1)	Polk Plant (1)
NOx	0.10	.072	.072	0.07
PM	0.015	.011	.011	0.007

(1) Permit limits written in terms of maximum lb/hr. The lb/mmBtu rate estimated from maximum heat input to the plant.

Analyses using consistent economic assumptions show that the cost of a new coal IGCC unit is competitive with the cost of a new well-controlled pulverized coal unit. For example, SFA Pacific, which has conducted studies for EPRI and the World Bank, calculated that a new coal IGCC unit can produce electricity for a total cost of $43 per megawatt-hour (MWh) based on capital costs of $1300/KW and fuel costs of $1/mmBtu. Using the same fuel cost and capital charge rate assumptions, SFA Pacific calculates that an ultra-super-critical pulverized coal plant with flue gas desulfurization (FGD) and selective catalytic reduction (SCR) would have identical electricity generating costs.[34] Were CO_2 removal to be required at both plants, however, the cost of electricity from the IGCC unit would be almost 20% lower than from the pulverized coal plant. If CO_2 removal is not required initially, an IGCC plant can be designed so that it can be easily retrofit for CO_2 removal in the future. The cost of designing this flexibility into an IGCC unit would be minimal—about one percent of the capital cost of the unit according to SFA Pacific.[35]

We have attached hereto a number of materials related to the availability of IGCC.

THE BACT ANALYSIS FAILS TO REFLECT EVEN THE MOST STRINGENT EMISSION LIMITS FOR OTHER CIRCULATING FLUIDIZED BED POWER PLANTS.

While IGCC must be thoroughly evaluated as part of the PSD permit application and as a predicate to a determination by Utah that the permit application is complete, we also note that there are serious deficiencies that must be remedied in evaluating even the proposed BACT emission limits for the CFB boiler. SPC's proposed NOx emission limit of 0.10 lb/mmBtu does not reflect the level of control that can be achieved by the proposed technology and control equipment. Specifically, as stated on page 5-7 of the application, NOx emissions from several other CFB facilities are more stringent than the rate proposed for the SPC project. SPC must achieve a NOx emission rate more stringent

[34] Simbeck, Dale and Donald Wilhelm, *Cost Estimates for Future Coal-Fired Electric Power Generation with and without CO_2 Capture for Sequestration*. Report to NRDC, October 2002.
[35] Id.

into the atmosphere each year. IPP failed to estimate CO_2 emissions, as well as other greenhouse gases entirely. Not only will these emissions affect local people and the immediate environment, it will also add significantly to the global amount of CO_2. Both the Clean Air Act, under NSR provisions, and Utah's administrative rules require that reasonable alternatives be considered. These laws also require that power plants employ the best available control technology.

Greenhouse gas emissions should be considered in each of the ITAs. In fact, the EPA's October 1990 New Source Review Workshop Manual specifically states that "[s]ignificant differences in noise levels, radiant heat, or dissipated static electrical energy, or greenhouse gas emissions may be considered" in assessing environmental impacts from a proposed coal plant. See, EPA NSR Workshop Manual, p. b.49. (attached). According to an article by Gregory B. Foote entitled "Considering Alternatives: The Case for Limiting CO_2 Emissions from New Power Plants Through New Source Review" (attached) Integrated Gasification Combined Cycle (IGCC) is the lowest emitting of all coal production NAAQS pollutant processes. IGCC exhibits superior performance and dramatically lowers the cost of removing mercury and other toxic metals, including CO_2. Foote, at 39. CO_2 removal is more efficient and less expensive at IGCC units. Foote, at 52. Adopting IGCC through NSR will benefit local citizens, help address the serious environmental and economic impacts associated with adding staggering amounts of CO_2 to the atmosphere, and assist the United States in complying with commitments under international law. As previously noted, several states, including some within the Rocky mountain region, treat IGCC as "available" technology under NSR purposes. Although IGCC has numerous benefits, NEVCO and IPSC, as well as UDAQ, did not consider this control technology. IGCC is the most effective control technology available and therefore required under BACT provisions of the Clean Air Act.

Moreover, neither of the ITAs adequately evaluated the use of clean fuels (biomass, etc.) as a means of reducing pollutants, such as greenhouse gases, SO_2, NOx, mercury and other pollutants.

Further, neither ITA evaluated the use of CO_2 offsets as a permit condition. UDAQ should include CO_2 offsets as a permit condition in each ITA to ensure that greenhouse gas emissions are minimized.

Thank you for the opportunity to submit this supplemental comment letter. Please place this supplemental comment letter, including all attachments, in the administrative record for each of the ITAs referenced above.

Sincerely,

Likewise, the National Coal Council, a federal advisory committee to the Secretary of Energy, states: "[I]ntegrated gasification combined cycle (IGCC) has become a viable, commercially available technology. With successes from the Clean Coal Technology Program in both new and repowered projects, much as been learned about IGCC performance, heat rate, cost, and emissions performance. This information, which has been widely published, has become an important tool for evaluation of this technology by electric utilities."[31] ChevronTexaco, in an October 2002 presentation, states that, "IGCC is a current viable choice for clean coal capacity."[32] And the Center for Energy and Economic Development (CEED) states that, "IGCC technology is available for deployment today."[33]

IGCC is an available control technology with demonstrated application.[34] Accordingly, Utah has a statutory duty to consider IGCC in its BACT analysis.

Recent State Actions Requiring Consideration of IGCC Confirm the Statutory Duty to Consider IGCC as a Core Part of Utah's BACT Analysis

Several states have recognized that IGCC is an available technology that must be considered in BACT determinations. In March 2003, the State of Illinois required the applicant for a proposed CFB coal-fired electric generation facility to conduct a robust analysis of IGCC as a core element of its BACT analysis, reasoning as follows:

> Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a 'production process' that can be used to produce electricity from coal. In this regard, the Illinois EPA has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.
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> Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant.[35]

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[31] *Increasing Electricity Availability From Coal-Fired Generation in the Near-Term* (May 2001) (emphasis added).
[32] "Clean Coal Technology Options – A Comparison of IGCC vs. Pulverized Coal Boilers," Luke O'Keefe and Karl Sturm (ChevronTexaco), October 28, 2002, p. 8.
[33] See www.ceednet.org/fueling/investing.asp
[34] See supra notes 8-11.
[35] Letter from Illinois Division of Air Pollution Control to Jim Schneider, Indeck-Elwood, LLC (March 8, 2003), attached hereto.

In an ensuing letter, the State of Illinois then formally informed EPA that Illinois has "concluded that it is appropriate for applicants for [proposed coal-fired power plants] to consider IGCC as part of their BACT demonstrations."[36]

On December 23, 2002, the State of New Mexico likewise determined that the permit applicant (Mustang Energy a subsidiary of Peabody Coal Company) for a proposed new pulverized coal power plant was required to conduct a site-specific analysis of IGCC as part of the BACT analysis for the proposed facility: "The Department requires a site-specific analysis of IGCC and CFB in order to make a determination regarding BACT for the proposed facility." The New Mexico determination goes on to provide: "The analysis must include a discussion of the technical feasibility and availability of IGCC and CFB for the proposed site in McKinley County, including a discussion of existing IGCC and CFB systems."[37]

On August 29, 2003, New Mexico issued its evaluation of the applicant's response. New Mexico found that the applicant's BACT analysis had in fact indicated that IGCC is commercially available but that the applicant had improperly relied on cost to find that the technology was infeasible thereby improperly conflating the technological and cost inquiries in the BACT analysis:

> Mustang [the applicant] concludes that neither IGCC nor CFB are technically feasible control options for the Mustang site. After careful review of the revised BACT analysis, as well as information gathered from independent sources, the Department determines that Mustang's conclusion is not supported by the evidence. Accordingly, the Department finds that Mustang has not demonstrated the technical infeasibility of IGCC and CFB. Moreover, applying the criteria in the NSR Manual, the Department determines that IGCC and CFB are technically feasible at the Mustang site, and must be evaluated in the remaining steps of the top down BACT methodology.
>
> (a) IGCC and CFB are technically feasible at the Mustang site. A technology is considered to be technically feasible if it is commercially available and applicable to the source under consideration. *See* NSR Manual at B.17-18. A technology is commercially available if it has reached a licensing and commercial sales stage of development. *Id.* A technology is applicable if it has been specified in a permit for the same or a similar source type. *Id.* Mustang's revised BACT analysis indicates that IGCC is commercially available, and IGCC has been specified in air quality permits for coal-fired power plants. *See, e.g.,* Lima Energy Facility, 580 megawatt coal-fired power plant. Similarly, CFB is commercially available and has been specified in air quality permits for coal-fired power plants. *See, e.g.,* AES Puerto Rico 454 megawatt coal-fired power plant; Reliant Energy Seward 584 megawatt coal-fired power plant.

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[36] Letter from Illinois EPA Director to EPA Regional Administrator, Region V (March 19, 2003), attached hereto.
[37] Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Dec. 23, 2002), attached hereto.

(b) For both IGCC and CFB, Mustang improperly relies on cost to determine technical infeasibility. A technology is technically feasible when the resolution of technical difficulties is a matter of cost. *See* NSR Manual at B.19-20. Mustang's revised BACT analysis indicates that the resolution of technical difficulties for both IGCC and CFB are a matter of cost. These costs do not support a finding of technical infeasibility, but may be considered during Step 4 of the top down BACT methodology. *See* NSR Manual at B.26.[38]

And the State of Montana determined, in an administrative appeals proceeding over the PSD permit for the proposed Roundup Power Project, that BACT requires consideration of IGCC: The Department "should have included IGCC and CFB in step 1 [of the BACT analysis] as control technologies." "The applicable definition of BACT includes innovative fuel combustion techniques [i.e., IGCC and CFB]." "The Department should propose the initiation of rulemaking to adopt the top-down five-step method. In the future, the Department should require applicants to consider innovative fuel combustion techniques in their BACT analyses and the Department should evaluate such techniques in its BACT determination in accordance with the top-down five-step method."[39]

These states' consideration of IGCC as part of the BACT determination is consistent with the plain terms of federal and state law. In light of this solid and growing body of precedents from sister states, Utah would be acting unreasonably and thus contrary to law were it not to likewise require consideration of IGCC as BACT.

IGCC Produces Substantial Environmental Benefits and Therefore Must Be Evaluated in Any Meaningful BACT Inquiry into the Maximum Degree of Pollution Reduction

The coal gasification fuel-processing step in IGCC power plants results in substantial air quality benefits. Gasifying coal at high pressure prior to combustion facilitates removal of pollutants that would otherwise be released into the air. According to James Childress, "...criteria pollutant emissions for a coal-based IGCC plant are well below those of even the most modern pulverized coal plants with post combustion cleanup."[40] Our previous submittals to the State of Utah have documented, in detail, the performance benefits in lower criteria pollutants and are hereby incorporated, by reference, into this memorandum.

IGCC also has several other environmental and energy advantages beyond its reductions in criteria pollutants. Because an IGCC plant is typically 10 to 15 percent more efficient in terms of heat rate compared to a circulating fluidized bed (CFB) unit,[41] greater environmental and

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[38] Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Aug. 29, 2003), at p. 3, attached hereto.

[39] Montana administrative appeals proceeding (June 23, 2003) (http://www.deq.state.mt.us/ber/2003_Agendas/june23_03/agendaJune_23_03.asp.)

[40] Childress, James M. Statement Submitted for the Record, Senate Environment and Public Works Subcommittee on Clean Air, Wetlands and Climate Change, January 29, 2002.

[41] Major Environmental Aspects of Gasification-Based Power Generation Technologies, US DOE, December 2002, Table 1-7, Page 1-26.

Utah Chapter Sierra Club
Wasatch Clean Air Coalition
Grand Canyon Trust
Rocky Mountain Office of Environmental Defense
Western Resource Advocates
Clean Air Task Force

April 9, 2004

By e-mail (jjenks@utah.gov), Fax (801) 536-4099, and Federal Express
John D. Jenks, Engineer
Utah Department of Environmental Quality
Director, Utah Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84116

Re: Comments on Intent to Approve NEVCO Energy Company's PSD Permit Application for the Sevier Power Company Project (September 2003) DAQE-IN2529001-04

Dear Mr. Jenks:

The Utah Chapter of the Sierra Club, Wasatch Clean Air Coalition, Rocky Mountain Office of Environmental Defense, Western Resource Advocates and Clean Air Task Force, respectfully provide the following comments on Utah Division of Air Quality's ("UDAQ") draft Intent to Approve ("ITA" or "draft permit") NEVCO Energy Company's September 2003 Prevention of Significant Deterioration Permit Application (Application) for the Sevier Power Company (SPC) Project. On October 17, 2003, we submitted extensive comments on NEVCO's revised PSD permit application. For the most part, none of the comments we raised were adequately addressed by UDAQ in the ITA for the SPC Project. A copy of that letter and attachments is attached and incorporated herein by reference to this letter. In summary, we believe it would be contrary to law and harmful to Utah's air quality for the UDAQ to approve the proposed construction of this facility without first addressing the serious deficiencies examined in detail below. We greatly appreciate your consideration of our views and UDAQ's efforts to make documents regarding this action easily available to interested parties.

THE ITA FAILS TO ADDRESS CARBON DIOXIDE AND OTHER GREENHOUSE GAS EMISSIONS

The ITA for the SPC Project did not address carbon dioxide (CO_2) or other greenhouse gases to be emitted from the SPC Project. However, such emissions can be quite significant from coal-fire boilers and, in particular, from circulating fluidized bed (CFB) boilers. The National Coal Council identifies fluidized bed combustion as an especially large source of the greenhouse gas nitrous oxide (N_2O), a problem that is not shared by the most common form of coal combustion technology, pulverized coal (PC):

> "N_2O has a GWP (Global Warming Potential) 296 times that of CO_2. Because of its long lifetime (about 120 years) it can reach the upper atmosphere, depleting the concentration of stratospheric ozone, an important filter of UV radiation. N_2O is emitted from fluidized bed coal combustion; global emissions from FBC units are 0.2 Mt/year, representing approximately 2% of total known sources. N_2O emissions from PC units are much lower. Typical N_2O emissions from FBC units are in the range of 40-70 ppm (at 3% O_2). This is significant because at 60 ppm, the N_2O emission from the FBC is equivalent to 1.8% CO_2, an increase of about 15% in CO_2 emissions for an FBC boiler. Several techniques have been proposed to control N_2O emissions from FBC boilers, but additional research is necessary to develop economically and commercially attractive systems."[1]

NEVCO estimates that the SPC Project has a potential to emit 2.2 million tons of carbon dioxide each year and 1,640 tons of nitrous oxide each year.[2] The nitrous oxide that would be released from the SPC Project is equivalent, in Global Warming Potential, to an additional 485,000 tons per year of carbon dioxide, or an effective 22% increase in the SPC Project's carbon dioxide emissions.

We believe that the EPA, and the State of Utah have a legal obligation to regulate CO_2 and other greenhouse gases as pollutants under the Clean Air Act and the Utah Air Conservation Act. Indeed, twelve states, fourteen environmental groups and two cities have filed suit in federal court stating that EPA must regulate greenhouse gas emissions under the Clean Air Act. Specifically, the parties appealed the U.S. EPA's decision to reject a petition that sought to have the federal government regulate greenhouse gas emissions from new motor vehicles.[3] If the federal court agrees that greenhouse gases, such as CO_2, must be regulated under the Clean Air Act, such a decision would also require the establishment of CO_2 emission limits in this permit for the SPC Project.

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[1] "Coal-Related Greenhouse Gas Management Issues", National Coal Council, May 2003 at page 7.
[2] Letter from Linda Conger of Meteorological Solutions, to John Jenks Utah Division of Air Quality, (December 5, 2003) at Appendix B
[3] Commonwealth of Massachusetts, et al. v. U.S. EPA, No. 03-1361 (Consolidated with Nos. 03-1362-1368) U.S. Court of Appeals for the District of Columbia Circuit.

Similarly, Utah state law also supports regulation of greenhouses gases under the minimum federal requirements and state law. The purposes of the Utah Air Conservation Act is to "provide for a coordinated statewide program for air pollution prevention, abatement, and control." Utah Code Ann. § 19-2-101(4)(a). The term air pollution "means the presence in the ambient air of one or more air contaminants in such quantities and duration and under conditions and circumstances, as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonable interfere with the enjoyment of life or use of property as determined by the standards, rules, and regulations adopted by the Air Quality Board (Section 19-2-104)." Utah Admin. Rule R307-101-2; Utah Code Ann. § 19-2-102. The State of Utah Division of Air Quality has recognized that "the consensus of most scientists worldwide is that increasing concentrations of greenhouse gases will lead to significant climate warming, shifts in precipitation patterns, and rising sea levels, although the magnitude, timing, and regional patterns of these changes cannot be accurately predicted at this time." Utah Division of Air Quality, *Greenhouse Gas Inventory-1990 and 1993,* available at www.airquality.utah.gov/PLANNING/Grnhsgas.htm. Accordingly, existing state legal authority supports the regulation of greenhouses gases by UDAQ in this permit.

FEDERAL AND STATE CLEAN AIR LAWS REQUIRE NEVCO TO CONSIDER THE APPLICATION OF PRODUCTION PROCESSES AND AVAILABLE METHODS, SYSTEMS AND TECHNIQUES TO LOWER AIRBORNE CONTAMINANTS.

Integrated Gasification Combined Cycle (IGCC) is an available, demonstrated clean coal combustion technology with significant emission reduction benefits. There are numerous benefits to IGCC, including fewer emissions of criteria and hazardous air pollutants, the opportunity for capturing greenhouse gases, such as CO_2, that cause global warming, and a general increase in efficiency over other coal burning technologies. Because NEVCO solely focused on Circulating Fluidized Bed (CFB) coal combustion and did not adequately consider IGCC in the SPC Project's BACT analysis, UDAQ must deny the proposed permit.

Utah and Federal Law Require a Thorough Evaluation of IGCC Cleaner Coal Combustion Technology as Part of the BACT Analysis.

Section 165(a)(4) of the Clean Air Act (CAA) provides that "no major emitting facility on which construction is commenced after August 7, 1977, may be constructed in any area to which this part applies unless…the facility is subject to the best available control technology for each pollutant subject to regulation under this chapter emitted from, or which results from, such facility."[4] The requirement for conducting a BACT analysis is codified at 40 CFR § 51.166(j), in regulations setting forth the requirements for state-administered PSD programs. Utah law, in turn, requires that an approval order may be

[4] 42 U.S.C. §7475(a)(4).

issued only if "[t]he degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least best available control technology. . ."[5]

BACT is then defined under Utah law as follows:

> [A]n emission limitation and/or other controls to include design, equipment, work practice, operation standard or combination thereof, based on the maximum degree of reduction of each pollutant subject to regulation under the Clean Air Act and/or Utah Air Conservation Act emitted from or which results from any emitting installation, which the Air Quality Board, on a case-by-case basis taking into account energy, environmental and economic impacts and other costs, determines is achievable for such installation through the application of production processes and available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant.[6]

The wording of the definition of BACT found within Utah's regulations is similar to the federal definition at 40 CFR § 51.166(b)(12). Indeed, Utah's definition of BACT must be consistent with the SIP requirements under federal regulations, which provide that "[a]ll State plans shall use the following definitions for the purposes of this section. Deviations from the following wording will be approved only if the State specifically demonstrates that the submitted definition is more stringent, or at least as stringent, in all respects" as the federal definitions.[7] Thus, the BACT requirement must be implemented and construed under Utah law at least as strictly as EPA and the federal courts have construed it.

This definition includes coal gasification. The legislative history of the amendment adding the term "innovative fuel combustion techniques" to the Clean Air Act's definition of "BACT" is clear. Coal gasification must be considered. The relevant passage of the debate is excerpted below:

> Mr. HUDDLESTON. Mr. President, the proposed provisions for application of best available control technology to all new major emission sources, although having the admirable intent of achieving consistently clean air through the required use of best controls, if not properly interpreted may deter the use of some of the most effective pollution controls. The definition in the committee bill of best available control technology indicates a consideration for various control strategies by including the phrase "through application of production processes and available methods systems, and techniques, including fuel cleaning or treatment." And I believe it is likely that the concept of BACT is intended to include such technologies as low Btu gasification and fluidized bed combustion. But, this intention is not explicitly spelled out, and I am concerned that without clarification, the possibility of misinterpretation would

[5] UT Air Quality Rules 307-401-6(1) (hereinafter "UT AQR").
[6] UT AQR 307-101-2.
[7] 40 CFR §51.166(b).

> remain. It is the purpose of this amendment to leave no doubt that in determining best available control technology, all actions taken by the fuel user are to be taken into account--be they the purchasing or production of fuels which may have been cleaned or up-graded through chemical treatment, gasification, or liquefaction; use of combustion systems such as fluidized bed combustion which specifically reduce emissions and/or the post-combustion treatment of emissions with cleanup equipment like stack scrubbers. The purpose, as I say, is just to be more explicit, to make sure there is no chance of misinterpretation. Mr. President, I believe again that this amendment has been checked by the managers of the bill and that they are inclined to support it.
>
> Mr. MUSKIE. Mr. President, I have also discussed this amendment with the distinguished Senator from Kentucky. I think it has been worked out in a form I can accept. I am happy to do so. I am willing to yield back the remainder of my time.[8]

EPA and federal courts have consistently interpreted the BACT provisions found in the CAA and the agency's regulations as embodying certain core criteria that require the permit applicant either to implement the most effective available means for minimizing air pollution or justify its selection of less effective means on grounds consistent with the purposes of the Act. In *Citizens for Clean Air v. EPA*,[9] the Ninth Circuit held that "initially the burden rests with the PSD applicant to identify the best available control." As stated in long-standing EPA guidance, "[r]egardless of the specific methodology used for determining BACT, be it 'top-down,' 'bottom-up,' or otherwise, the same core criteria apply to any BACT analysis: the applicant must consider all available alternatives, and [either select the most stringent of them or] demonstrate why the most stringent should not be adopted."[10] Accordingly, the PSD permit applicant not only must identify all available technologies, including the most stringent, but it must also provide adequate justification for dismissing any available technologies.

Consistent with these core criteria, the EPA's New Source Review (NSR) Workshop Manual establishes that, as the first step in the "top-down" BACT analysis, the applicant *must* consider all "available" control options:

> The first step in a "top-down" analysis is to identify, for the emissions unit in question (the term "emissions unit" should be read to mean emissions unit, process or activity), all "available" control options. Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. Air pollution control technologies and techniques include the application of production process or available

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[8] 95th Congress, 1st Session (Part 1 of 2) June 10, 1977 Clean Air Act Amendments of 1977 A&P 123 Cong. Record S9421.

[9] 959 F.2d 839, 845 (9th Cir. 1992).

[10] Memorandum from John Calcagni, Director of EPA Air Quality Management Division, to EPA Regional Air Directors (June 13, 1989), at 4 (emphasis added).

> methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the affected pollutant. This includes technologies employed outside of the United States. As discussed later, in some circumstances inherently lower-polluting processes are appropriate for consideration as available control alternatives.[11]

"The term 'available' is used…to refer to whether the technology 'can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term.'"[12] In keeping with the stringent nature of the BACT requirement, EPA has repeatedly emphasized that "available"

> is used in the broadest sense under the first step and refers to control options with a "practical *potential* for application to the emissions unit" under evaluation. . . . The goal of this step is to develop a comprehensive list of control options.[13]

EPA adjudicatory decisions also examine the core requirements for the BACT determination process. "Under the top-down methodology, applicants must apply the best available control technology unless they can demonstrate that the technology is technically or economically infeasible. The top-down approach places the burden of proof on the *applicant* to justify why the proposed source is unable to apply the best technology available."[14]

Whatever analytical process is utilized for determining BACT, these core criteria – the requirement to consider all available technologies, including the most stringent, and to provide adequate justification in the administrative record for dismissing any of the technologies based on relevant statutory factors – must be satisfied.

Thus, to conduct a BACT analysis consistent with the requirements of state and federal law, UDAQ and NEVCO must thoroughly evaluate all available control measures. IGCC

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[11] NSR Manual, at p. B.5 (emphasis added).

[12] In re: Maui Electric Company, PSD Appeal No. 98-2 (EAB September 10, 1998), at 29-30 (quoting NSR Manual at B.17).

[13] In re: Knauf Fiber Glass, PSD Appeal Nos. 98-3 – 98-20 (EAB February 4, 1999), at 12-13 (quoting NSR Manual at B.5) (emphasis added by EAB); see also In re: Steel Dynamics, Inc., PSD Appeal Nos. 99-4 and 99-5 (EAB June 22, 2000), at 29 n.24 (citing Knauf with approval); NSR Manual at B.10 ("The objective in step 1 is to identify all control options with potential application to the source and pollutant under evaluation."); id. at B.6 (emphasizing that a proper Step 1 list is "comprehensive").

[14] In re: Spokane Regional Waste-to-Energy Applicant, PSD Appeal No. 88-12 (EPA June 9, 1989), at 9) (internal quotation marks omitted) (emphasis in original); see also In re: Inter-Power of New York, Inc. PSD Appeal Nos. 92-8 and 92-9 (EAB March 16, 1994) ("Under the 'top-down' approach, permit applicants must apply the most stringent control alternative, unless the applicant can demonstrate that the alternative is not technically or economically achievable."); In the Matter of Pennsauken County, New Jersey Resource Recovery Facility, PSD Appeal No. 88-8 (EAB November 10, 1988) ("Thus, the 'top-down' approach shifts the burden of proof to the applicant to justify why the proposed source is unable to apply the best technology available.")

is available today. Utah and federal law therefore require that IGCC be thoroughly evaluated as part of the BACT analysis.

Contrary to law, NEVCO does not adequately consider this available method, system, and technique in its BACT analysis but instead focuses exclusively on CFB. The definitions of BACT under Utah and federal law, and the core requirements of the BACT analysis under federal case law, EPA adjudicatory decisions, and the New Source Review Manual, demonstrate that an available technique such as IGCC must be identified and evaluated as a control option in the first step of the BACT analysis. These are minimum core requirements of a state-administered PSD program.

Recent State Actions Requiring Consideration of IGCC Establish Irrefutable Precedence for the Consideration of IGCC.

In March 2003, the State of Illinois required the applicant for a proposed CFB coal-fired electric generation facility to conduct a robust analysis of IGCC as a core element of its BACT analysis:

> Additional material must be provided in the BACT demonstration to address Integrated Gasification Coal Combustion (IGCC) as it is a 'production process' that can be used to produce electricity from coal. In this regard, the Illinois EPA has determined that IGCC qualifies as an alternative emission control technique that must be addressed in the BACT demonstration for the proposed plant. In addition, based on the various demonstration projects that have been completed for IGCC, the Illinois EPA believes that IGCC constitutes a technically feasible production process.
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> Accordingly, Indeck must provide detailed information addressing the emission performance levels of IGCC, in terms of expected emissions rates and possible emission reductions, and the economic, environmental and/or energy impacts that would accompany application of IGCC to the proposed plant. This information must be accompanied by copies of relevant documents that are the basis of or otherwise substantiate the facts, statements and representations about IGCC provided by Indeck. In this regard, Indeck as the permit applicant is generally under an obligation to undertake a significant effort to provide data and analysis in its application to support the determination of BACT for the proposed plant.[15]

In an ensuing letter, the State of Illinois then formally informed EPA that Illinois has "concluded that it is appropriate for applicants for [proposed coal-fired power plants] to consider IGCC as part of their BACT demonstrations."[16]

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[15] Letter from Illinois Division of Air Pollution Control to Jim Schneider, Indeck-Elwood, LLC (March 8, 2003), attached hereto.

[16] Letter from Illinois EPA Director to EPA Regional Administrator, Region V (March 19, 2003), attached hereto.

Reflecting the viability of IGCC, the State of New Mexico issued a letter on December 23, 2002 requiring the permit applicant (Mustang Energy a subsidiary of Peabody Coal Company) for a proposed new pulverized coal power plant to conduct a site-specific analysis of IGCC as part of the BACT analysis for the proposed facility: "The Department requires a site-specific analysis of IGCC and CFB in order to make a determination regarding BACT for the proposed facility." The New Mexico determination goes on to provide: "The analysis must include a discussion of the technical feasibility and availability of IGCC and CFB for the proposed site in McKinley County, including a discussion of existing IGCC and CFB systems."[17]

On August 29, 2003, New Mexico issued its evaluation of the applicant's response. New Mexico found that the applicant's BACT analysis had in fact indicated that IGCC is commercially available but that the applicant had improperly relied on cost to find that the technology was infeasible:

> Mustang concludes that neither IGCC nor CFB are technically feasible control options for the Mustang site. After careful review of the revised BACT analysis, as well as information gathered from independent sources, the Department determines that Mustang's conclusion is not supported by the evidence. Accordingly, the Department finds that Mustang has not demonstrated the technical infeasibility of IGCC and CFB. Moreover, applying the criteria in the NSR Manual, the Department determines that IGCC and CFB are technically feasible at the Mustang site, and must be evaluated in the remaining steps of the top down BACT methodology.
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> (b) For both IGCC and CFB, Mustang improperly relies on cost to determine technical infeasibility. A technology is technically feasible

17 Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Dec. 23, 2002), attached hereto.

> when the resolution of technical difficulties is a matter of cost. *See* NSR Manual at B.19-20. Mustang's revised BACT analysis indicates that the resolution of technical difficulties for both IGCC and CFB are a matter of cost. These costs do not support a finding of technical infeasibility, but may be considered during Step 4 of the top down BACT methodology. *See* NSR Manual at B.26.[18]

It would be arbitrary and capricious were Utah not to likewise require consideration of IGCC as BACT. The December 2002 and August 2003 New Mexico determinations and the March 2003 Illinois determination are attached hereto.

Attached is a memorandum from Vickie Patton of Environmental Defense and Joro Walker of Western Resource Advocates explaining the legal basis for requiring consideration of IGCC in the BACT analysis, which was previously provided to your office.

NEVCO Failed to Adequately Address IGCC in the BACT Analysis and the Permit Must be Denied. A Properly Conducted BACT Analysis Shows IGCC is BACT for the SPC Project.

IGCC is an available method, system and technique for curbing air pollutants from the proposed SPC project consistent with Utah's definition of BACT.[19] The extent of analysis by NEVCO of IGCC is limited to the following:

> "Integrated gasification coal combustion (IGCC) was evaluated as an alternative production process for generating electricity from coal. Integrated gasification coal combustion is a two stage process. In the first stage, coal or other fuel are first gasified to produce a synthetic gaseous fuel. In the second stage, this gaseous fuel is then used to fire combined cycle turbines to generate electricity. For the Sevier Power Company Project, IGCC was not chosen due to the higher costs."[20]

NEVCO's vague statement of "higher costs" is a general measure of affordability, and is expressly prohibited by the NSR Manual:[21]

> "In the economical impacts analysis, primary consideration should be given to quantifying the cost of control and not the economic situation of the individual source. Consequently, applicants generally should not propose elimination of control alternatives on the basis of economic parameters that provide an indication of the affordability of a control alternative relative to the source. BACT

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[18] Letter from New Mexico Environment Department to Larry Messinger, Mustang Energy Company (Aug. 29, 2003), at p. 3, attached hereto.
[19] UT AQR 307-101-2.
[20] Letter from Linda Conger of Meteorological Solutions, to John Jenks Utah Division of Air Quality, (December 5, 2003) at page 8.
[21] Draft New Source Review Manual, Page B-31

is required by law. Its costs are integral to the overall cost of doing business and are not to be considered an afterthought."

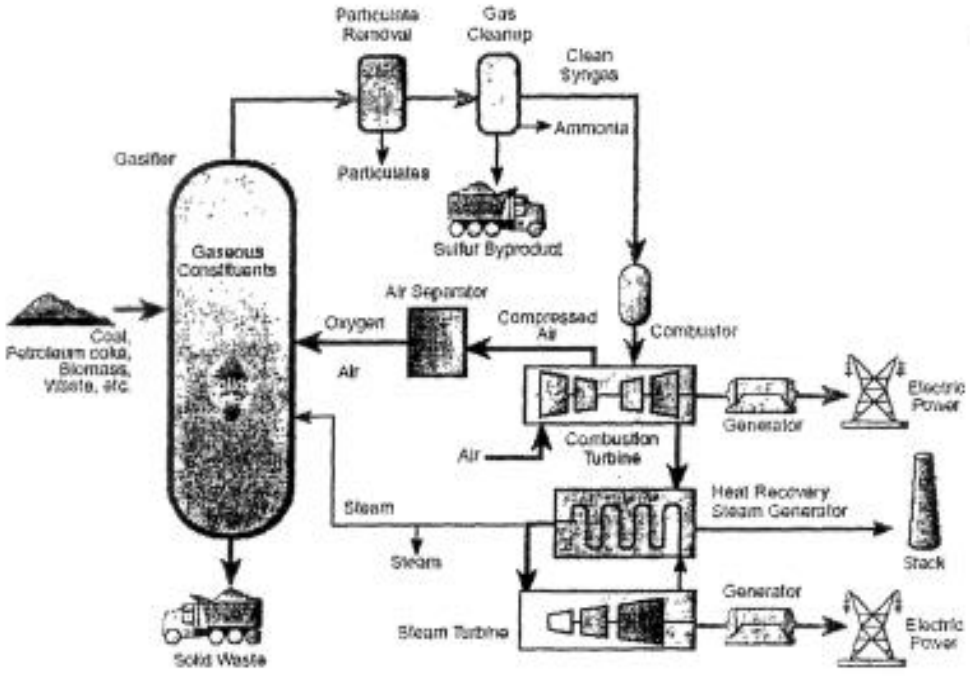
NEVCO should have provided documentation and information consistent with the requirements of a Top-Down BACT analysis. NEVCO's failure to do so requires UDAQ to deny the permit.

The following evaluates IGCC in a Top-Down BACT analysis relative to the CFB and controls selected by NEVCO and proposed in the ITA:

Step 1: Identify All Available Control Technologies.

Conclusion: IGCC is an Available Control Technology

Electricity generation from coal using IGCC technology is a commercially available and proven process. IGCC units generate electricity by integrating a coal gasifier with combined cycle (combustion turbine and steam turbine) electricity generation equipment (see figure below).



Two full scale commercial IGCC electric generating units are in operation in the United States: Tampa Electric Company's 262 MW unit at the Polk plant in Florida and Cinergy's 192 MW unit at the Wabash River plant in Indiana, which both rely on coal as